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Val Ser Gln Ala Val Ala Val Pro Leu Asn Gln Ser Gln Tyr Asp Ala
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Thr Leu Leu Lys Lys Leu Asn Lys Gln Asp Tyr Val Gly Ala Gly Asn
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Pro	Gly	Arg	Phe	Arg	Thr	Gly	Trp	His	His	Leu	Pro	His	Asp	Leu	Pro

785 790 795 800
 Ala Leu Arg Asp Ile Thr Arg Phe His Ala Val Val Asn Arg Ser Gly
 805 810 815
 Ser His Ala Gly Glu Val Leu Thr Ala Leu Glu Thr Gly Glu Leu Ser
 820 825 830
 Ser Ala Leu Leu Ala Arg Ala Leu Ser Gln Asn Glu Gln Asp Val Thr
 835 840 845
 Gly Ala Leu Ala Gln Val Arg Gly Ala Gly Glu Gln Asp Asn Ser Val
 850 855 860
 Phe Thr Ser Trp Glu Glu Val Asp Gln Ala Glu Gln Trp Leu Asp Met
 865 870 875 880
 Ser Glu Thr Leu Ser Ile Thr Pro Ser Gly Leu Ala Ser Leu Ile Ala
 885 890 895
 Leu Lys Tyr Ile Asn Val Ser Asp Asp Ser Ala Pro Leu Tyr Ser Gln
 900 905 910
 Trp Gln Val Val Ser Gly Leu Leu Gln Ala Gly Leu Lys Ser Ser Gln
 915 920 925
 Ser Ser Ala Leu His Asp Tyr Leu Glu Glu Gly Thr Ser Ser Ala Leu
 930 935 940
 Cys Ala Tyr Tyr Leu Arg Asn Leu Ala Pro Asn Met Val Ser Gly Arg
 945 950 955 960
 Asp Asp Leu Phe Gly Tyr Leu Leu Leu Asp Asn Gln Val Ser Ala Lys
 965 970 975
 Val Lys Thr Thr Arg Ile Ala Glu Ala Ile Ala Gly Ile Arg Leu Tyr
 980 985 990
 Ile Asn Arg Ala Leu Asn Gly Ile Glu Leu Ser Ala Met Ala Glu Val
 995 1000 1005
 Arg Gly Arg Gln Phe Phe Thr Asp Trp Asp Thr Phe Asn Lys Arg Tyr
 1010 1015 1020
 Ser Thr Trp Ala Gly Val Ser Glu Leu Val Tyr Tyr Pro Glu Asn Tyr
 1025 1030 1035 1040
 Leu Asp Pro Thr Val Arg Ile Gly Gln Thr Gly Met Met Asp Thr Leu
 1045 1050 1055
 Leu Gln Ser Val Ser Gln Ser Ser Ile Asn Arg Asp Thr Val Glu Asp
 1060 1065 1070
 Ala Phe Lys Thr Tyr Leu Thr Thr Phe Glu Gln Ile Ala Asn Leu Asn
 1075 1080 1085
 Thr Val Ser Gly Tyr His Asp Asn Ala Ser Met Thr Gln Gly Thr Thr
 1090 1095 1100
 Trp Tyr Val Gly Arg Ser Ile Thr Asp Gln Thr Asn Trp Tyr Trp Arg
 1105 1110 1115 1120
 Ser Ala Asn His Ser Lys Ile Gln Asp Ser Met Met Pro Ala Asn Ala
 1125 1130 1135
 Trp Thr Gly Trp Thr Lys Ile Asn Cys Gly Met Asn Pro Trp Ser Asp
 1140 1145 1150
 Leu Val Cys Ser Val Phe Phe Asn Ser Arg Leu Tyr Val Val Trp Val
 1155 1160 1165
 Glu Glu Asn Gln Ser Ala Asp Thr Glu Ala Glu Ser Thr Thr Thr Thr
 1170 1175 1180
 Gln Gln Ser Tyr Thr Leu Lys Leu Ser Phe Arg Arg Tyr Asp Gly Thr
 1185 1190 1195 1200
 Trp Ser Ser Pro Val Ser Phe Asp Ile Thr Gly Asn Ile Ala Phe Pro
 1205 1210 1215
 Glu Thr Gln Gly Met His Val Thr Cys Asn Pro Leu Thr Glu Gln Leu
 1220 1225 1230
 Tyr Cys Ala Phe Tyr Ser Val Thr Ser Lys Pro Asp Phe Asp Asn Ala
 1235 1240 1245
 Gln Leu Ile Ser Val Asp Asn Asp Met Thr Leu Asn Val Ile Ser Asp
 1250 1255 1260
 Ile Gly Ile Phe Lys Ser Val Ser His Glu Phe Asn Thr Ser Thr Glu
 1265 1270 1275 1280
 Lys Phe Ile Asn Asn Val Phe Ser Asp Pro Ser Ala Asn Tyr Phe Val
 1285 1290 1295

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Ser Ala Thr Ser Leu Ile Asp Asp Val Ile His Ser Asp Phe Ser Leu
1300 1305 1310
Leu Asn Ser Lys Thr Thr Ser Thr Val Phe Thr Asn Glu Asp Ser Ser
1315 1320 1325
Leu Leu Thr Pro Glu Leu His Ile Thr Ala Asn Val Ser Cys Phe Val
1330 1335 1340
Ser Thr Ala Gly Ile Ala Thr Gln Ser Thr Ile Glu Lys Phe Val Gln
1345 1350 1355 1360
Ala Gly Ile Glu Phe Glu Glu Ile Asn Phe Tyr Ala Gly Gln Ala Ala
1365 1370 1375
Gly Gly Phe Asp Gly Phe Val Gly Val Asp Val Ser Asn Ser Lys Val
1380 1385 1390
Tyr Gln Val Gly Lys Glu Ala Val Gly Val Thr Val Lys Ser Tyr Ser
1395 1400 1405
Val Thr Gly Val Ser Gly Ser Val Glu Leu Phe Ile Asp Ser Ser Asn
1410 1415 1420
Lys Tyr Phe Ser Gly Ile Leu Ser Asp Lys Met Ile Thr Ala Leu Ile
1425 1430 1435 1440
Ser Gly Ser Thr Ser Lys Val Asn Tyr Val Ser Ser Ile Gly Ser Gln
1445 1450 1455
Asp Phe Trp Ser Val Lys Ser Leu Met Pro Ala Leu Gln Ile Tyr Glu
1460 1465 1470
Leu Ile Asp Asp Ile Ile Leu Thr Ser Gly Val Asn Gly Thr Glu Ile
1475 1480 1485
Lys Ser Trp Pro Ser Ala Glu Trp Tyr Asn Asp Lys Leu Ser Leu Gln
1490 1495 1500
Ser Gly Asn Asn Leu Phe Asn Thr Lys Ser Leu Ser Phe Thr Val Asn
1505 1510 1515 1520
Thr Ser Asp Ile Val Glu Asp Glu Phe Asp Val Thr Phe Thr Phe Thr
1525 1530 1535
Ala Val Asp Gln Asn Asn Val Val Leu Ala Ala Arg Thr Ala Ile Leu
1540 1545 1550
Thr Val Ile Arg Asn Ile Asn Asn Asp Thr Ser Val Ile Ala Leu Arg
1555 1560 1565
Lys Asn Thr Arg Gly Ala Gln Tyr Ile Arg Phe Thr Ala Gly Asn Asp
1570 1575 1580
Val Ala Leu Ile Arg Leu Asn Thr Leu Phe Ala Arg Gln Leu Val Asp
1585 1590 1595 1600
Arg Ala Asn Thr Gly Ile Asp Thr Ile Leu Ser Met Glu Thr Gln Arg
1605 1610 1615
Leu Thr Glu Pro Ala Leu Glu Glu Gly Ser Asp Val Phe Met Asp Phe
1620 1625 1630
Ser Gly Ala Asn Ala Leu Tyr Phe Trp Glu Leu Phe Tyr Tyr Thr Pro
1635 1640 1645
Met Met Val Phe Gln Arg Leu Leu Gln Glu Gln His Phe Pro Glu Ala
1650 1655 1660
Thr Arg Trp Leu Gln Tyr Val Trp Asn Pro Ala Gly His Val Val Asn
1665 1670 1675 1680
Gly Val Leu Gln Asn Tyr Thr Trp Asn Val Arg Pro Leu Glu Glu Asp
1685 1690 1695
Thr Gly Trp Asn Asp Ser Pro Leu Asp Ser Ile Asp Pro Asp Ala Ile
1700 1705 1710
Ala Gln Tyr Asp Pro Met His Tyr Lys Val Ala Thr Phe Met Ser Tyr
1715 1720 1725
Leu Asp Leu Leu Ile Ala Arg Gly Asp Ala Ala Tyr Arg Leu Leu Glu
1730 1735 1740
Arg Asp Thr Leu Asn Glu Ala Arg Met Trp Tyr Val Gln Ala Leu Asn
1745 1750 1755 1760
Leu Leu Gly Asp Glu Pro Tyr Ile Ser Phe Asp Ala Asp Trp Ser Ala
1765 1770 1775
Leu Thr Leu Gly Asp Ala Ala Ser Glu Val Thr Arg Arg Asp Tyr Gln
1780 1785 1790
Glu Ala Leu Leu Ala Val Arg Arg Leu Val Pro Ala Pro Glu Thr Arg

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1795 1800 1805
 Thr Ala Asn Ser Leu Thr Ala Leu Phe Leu Pro Gln Gln Asn Glu Val
 1810 1815 1820
 Leu Lys Gly Tyr Trp Gln Thr Leu Ala Gln Arg Leu His Asn Leu Arg
 1825 1830 1835 1840
 His Asn Leu Ser Ile Asp Gly Gln Pro Leu Ser Leu Ser Val Tyr Ala
 1845 1850 1855
 Thr Pro Ser Glu Pro Ser Ala Leu Gln Ser Ala Val Val Asn Ser Ala
 1860 1865 1870
 Gln Gly Ala Ala Ala Leu Pro Ala Ala Val Met Pro Leu Tyr Ser Phe
 1875 1880 1885
 Pro Val Met Leu Glu Asn Ala Arg Gly Met Val Ser Leu Leu Thr Gly
 1890 1895 1900
 Phe Gly Asn Thr Leu Leu Gly Ile Thr Glu Arg Gln Asp Ala Glu Ala
 1905 1910 1915 1920
 Leu Ala Lys Leu Leu Gln Thr Gln Gly Ser Glu Leu Ile Arg Gln Gly
 1925 1930 1935
 Leu Arg Gln Gln Asp Asn Val Leu Glu Ile Asp Ala Asp Ile Ala
 1940 1945 1950
 Ala Leu Glu Ser Arg Arg Gly Ala Gln Met Arg Phe Glu Arg Tyr
 1955 1960 1965
 Lys Val Leu Tyr Glu Ala Asp Val Asn Thr Gly Glu Lys Gln Ala Met
 1970 1975 1980
 Asp Leu Tyr Leu Ser Ser Ser Val Leu Ser Ala Ser Thr Ala Ala Leu
 1985 1990 1995 2000
 Phe Leu Ala Glu Ala Ala Asp Met Leu Pro Asn Ile Tyr Gly Leu
 2005 2010 2015
 Ala Val Gly Gly Ser Arg Tyr Gly Ala Leu Phe Lys Ala Thr Ala Ile
 2020 2025 2030
 Gly Ile Gln Val Ser Ser Asp Ala Thr Arg Ile Ser Ala Asp Lys Ile
 2035 2040 2045
 Ser Gln Ser Glu Val Tyr Arg Arg Arg Glu Glu Trp Glu Ile Gln
 2050 2055 2060
 Arg Asp Ser Ala Gln Ser Asp Val Ala Gln Ile Asp Ala Gln Leu Ala
 2065 2070 2075 2080
 Ala Met Ala Val Arg Arg Glu Gly Ala Glu Leu Gln Lys Thr Tyr Leu
 2085 2090 2095
 Glu Thr Gln Gln Thr Gln Ala Gln Ala Gln Leu Ala Phe Leu Gln Ser
 2100 2105 2110
 Lys Phe Asn Asn Thr Ala Leu Tyr Ser Trp Leu Arg Gly Arg Leu Ser
 2115 2120 2125
 Ala Ile Tyr Tyr Gln Phe Tyr Asp Leu Ala Val Ser Arg Cys Leu Met
 2130 2135 2140
 Ala Gln Gln Ala Trp Gln Trp Asp Lys Phe Glu Thr Arg Ser Phe Ile
 2145 2150 2155 2160
 Gln Pro Gly Ala Trp Met Gly Ala Asn Ala Gly Leu Leu Ala Gly Glu
 2165 2170 2175
 Thr Leu Met Leu Asn Leu Ala Gln Met Glu Gln Ala Trp Leu Thr Gly
 2180 2185 2190
 Asp Glu Arg Ala Ile Glu Val Thr Arg Thr Val Cys Leu Ser Glu Val
 2195 2200 2205
 Tyr Thr Ser Leu Ala Glu Asp Ala Ala Phe Ser Leu Ala Asp Lys Val
 2210 2215 2220
 Val Glu Leu Val Ser Asn Gly Ser Gly Ser Ala Gly Thr Lys Ser Asn
 2225 2230 2235 2240
 Gly Leu Gln Met Asp Gln Gln Gln Leu Glu Ala Thr Leu Lys Leu Ala
 2245 2250 2255
 Asp Leu Gly Ile Gly Asn Asp Tyr Pro Val Ser Leu Gly Thr Met Arg
 2260 2265 2270
 Arg Ile Lys Gln Ile Ser Val Thr Leu Pro Ala Leu Val Gly Pro Tyr
 2275 2280 2285
 Gln Asp Val Arg Ala Val Leu Ser Tyr Gly Gly Ser Met Val Met Pro
 2290 2295 2300

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Arg Gly Cys Ser Ala Leu Ala Val Ser His Gly Met Asn Asp Ser Gly
 2305 2310 2315 2320
 Gln Phe Gln Leu Asp Phe Asn Asp Pro Arg Tyr Leu Pro Phe Glu Gly
 2325 2330 2335
 Leu Pro Val Asp Asp Thr Gly Thr Leu Thr Leu Ser Phe Pro Asp Ala
 2340 2345 2350
 Asp Gly Lys Gln Gln Ala Met Leu Ser Leu Ser Asp Ile Ile Leu
 2355 2360 2365
 His Ile Arg Tyr Thr Ile Ile Ser
 2370 2375

<210> 5
 <211> 1428
 <212> PRT
 <213> Serratia entomophila

<400> 5
 Met Gln Asn His Gln Asp Met Ala Ile Thr Ala Pro Thr Leu Pro Ser
 1 5 10 15
 Gly Gly Gly Ala Val Thr Gly Leu Lys Gly Asp Ile Ala Ala Ala Gly
 20 25 30
 Pro Asp Gly Ala Ala Thr Leu Ser Ile Pro Leu Pro Val Ser Pro Gly
 35 40 45
 Arg Gly Tyr Ala Pro Thr Gly Ala Leu Asn Tyr His Ser Arg Ser Gly
 50 55 60
 Asn Gly Pro Phe Gly Ile Gly Trp Gly Ile Gly Gly Ala Ala Val Gln
 65 70 75 80
 Arg Arg Thr Arg Asn Gly Ala Pro Thr Tyr Asp Asp Thr Asp Glu Phe
 85 90 95
 Thr Gly Pro Asp Gly Glu Val Leu Val Pro Ala Leu Thr Ala Ala Gly
 100 105 110
 Thr Gln Glu Ala Arg Gln Ala Thr Ser Leu Leu Gly Ile Asn Pro Gly
 115 120 125
 Gly Ser Phe Asn Val Gln Val Tyr Arg Ser Arg Thr Glu Gly Ser Leu
 130 135 140
 Ser Arg Leu Glu Arg Trp Leu Pro Ala Asp Glu Thr Glu Thr Glu Phe
 145 150 155 160
 Trp Val Leu Tyr Thr Pro Asp Gly Gln Val Ala Leu Leu Gly Arg Asn
 165 170 175
 Ala Gln Ala Arg Ile Ser Asn Pro Thr Ala Pro Thr Gln Thr Ala Val
 180 185 190
 Trp Leu Met Glu Ser Ser Val Ser Leu Thr Gly Glu Gln Met Tyr Tyr
 195 200 205
 Gln Tyr Arg Ala Glu Asp Asp Asp Gly Cys Asp Glu Ala Glu Arg Asp
 210 215 220
 Ala His Pro Gln Ala Gly Ala Gln Arg Tyr Pro Val Ala Val Trp Tyr
 225 230 235 240
 Gly Asn Arg Gln Ala Ala Arg Thr Leu Pro Ala Leu Val Ser Thr Pro
 245 250 255
 Ser Met Asp Ser Trp Leu Phe Ile Leu Val Phe Asp Tyr Gly Glu Arg
 260 265 270
 Ser Ser Val Leu Ser Glu Ala Pro Ala Trp Gln Thr Pro Gly Ser Gly
 275 280 285
 Glu Trp Leu Cys Arg Gln Asp Cys Phe Ser Gly Tyr Glu Phe Gly Phe
 290 295 300
 Asn Leu Arg Thr Arg Arg Leu Cys Arg Gln Val Leu Met Phe His Tyr
 305 310 315 320
 Leu Gly Val Leu Ala Gly Ser Ser Gly Ala Asn Asp Ala Pro Ala Leu
 325 330 335
 Ile Ser Arg Leu Leu Asp Tyr Arg Glu Ser Pro Ser Leu Ser Leu
 340 345 350
 Leu Glu Asn Val His Gln Val Ala Tyr Glu Ser Asp Gly Thr Ser Cys

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Ala	Leu	Pro	Ala	Leu	Ala	Leu	Gly	Trp	Gln	Thr	Phe	Thr	Pro	Pro	Thr
	370					375					380				
Leu	Ser	Ala	Trp	Gln	Thr	Arg	Asp	Asp	Met	Gly	Lys	Leu	Ser	Leu	Leu
385					390					395					400
Gln	Pro	Tyr	Gln	Leu	Val	Asp	Leu	Asn	Gly	Glu	Gly	Val	Val	Gly	Ile
				405					410					415	
Leu	Tyr	Gln	Asp	Ser	Gly	Ala	Trp	Trp	Tyr	Arg	Glu	Pro	Val	Arg	Gln
			420					425					430		
Ser	Gly	Asp	Asp	Pro	Asp	Ala	Val	Thr	Trp	Gly	Ala	Ala	Ala	Ala	Leu
		435				440						445			
Pro	Thr	Met	Pro	Ala	Leu	His	Asn	Ser	Gly	Ile	Leu	Ala	Asp	Leu	Asn
	450					455					460				
Gly	Asp	Gly	Arg	Leu	Glu	Trp	Val	Val	Thr	Ala	Pro	Gly	Val	Ala	Gly
465					470					475					480
Met	Tyr	Asp	Arg	Thr	Pro	Gly	Arg	Asp	Trp	Leu	His	Phe	Thr	Pro	Leu
				485					490					495	
Ser	Ala	Leu	Pro	Val	Glu	Tyr	Ala	His	Pro	Lys	Ala	Val	Leu	Ala	Asp
			500					505					510		
Ile	Leu	Gly	Ala	Gly	Leu	Thr	Asp	Met	Val	Leu	Ile	Gly	Pro	Arg	Ser
		515					520					525			
Val	Arg	Leu	Tyr	Ser	Gly	Lys	Asn	Asp	Gly	Trp	Asn	Lys	Gly	Glu	Thr
	530					535					540				
Val	Gln	Gln	Thr	Glu	Arg	Leu	Thr	Leu	Pro	Val	Pro	Gly	Val	Asp	Pro
545					550					555					560
Arg	Thr	Leu	Val	Ala	Phe	Ser	Asp	Met	Ala	Gly	Ser	Gly	Gln	Gln	His
				565					570					575	
Leu	Thr	Glu	Val	Arg	Ala	Asn	Gly	Val	Arg	Tyr	Trp	Pro	Asn	Leu	Gly
			580					585					590		
His	Gly	Arg	Phe	Gly	Gln	Pro	Val	Asn	Ile	Pro	Gly	Phe	Ser	Gln	Ser
		595					600					605			
Val	Thr	Thr	Phe	Asn	Pro	Asp	Gln	Ile	Leu	Leu	Ala	Asp	Thr	Asp	Gly
	610					615					620				
Ser	Gly	Thr	Thr	Asp	Leu	Ile	Tyr	Ala	Met	Ser	Asp	Arg	Leu	Val	Ile
625					630					635					640
Tyr	Phe	Asn	Gln	Ser	Gly	Asn	Tyr	Phe	Ala	Glu	Pro	His	Thr	Leu	Leu
				645					650					655	
Leu	Pro	Lys	Gly	Val	Arg	Tyr	Asp	Arg	Thr	Cys	Ser	Leu	Gln	Val	Ala
			660					665					670		
Asp	Ile	Gln	Gly	Leu	Gly	Val	Pro	Ser	Leu	Leu	Leu	Thr	Val	Pro	His
		675					680					685			
Val	Ala	Pro	His	His	Trp	Val	Cys	His	Leu	Ser	Ala	Asp	Lys	Pro	Trp
	690					695					700				
Leu	Leu	Asn	Gly	Met	Asn	Asn	Met	Gly	Ala	Arg	His	Ala	Leu	His	
705					710				715					720	
Tyr	Arg	Ser	Ser	Val	Gln	Phe	Trp	Leu	Asp	Glu	Lys	Ala	Glu	Ala	Leu
				725					730					735	
Ala	Ala	Gly	Ser	Ser	Pro	Ala	Cys	Tyr	Leu	Pro	Phe	Thr	Leu	His	Thr
			740					745					750		
Leu	Trp	Arg	Ser	Val	Val	Gln	Asp	Glu	Ile	Thr	Gly	Asn	Arg	Leu	Val
		755					760					765			
Ser	Asp	Val	Leu	Tyr	Arg	His	Gly	Val	Trp	Asp	Gly	Gln	Glu	Arg	Glu
	770					775					780				
Phe	Arg	Gly	Phe	Gly	Phe	Val	Glu	Ile	Arg	Asp	Thr	Asp	Thr	Leu	Ala
785					790					795					800
Ser	Gln	Gly	Thr	Ala	Thr	Glu	Leu	Ser	Met	Pro	Ser	Val	Ser	Arg	Asn
				805					810					815	
Trp	Tyr	Ala	Thr	Gly	Val	Pro	Ala	Val	Asp	Glu	Arg	Leu	Pro	Glu	Thr
			820					825					830		
Tyr	Trp	Gln	Asn	Asp	Ala	Ala	Ala	Phe	Ala	Asp	Phe	Ala	Thr	Arg	Phe
		835					840					845			
Thr	Val	Gly	Ser	Gly	Glu	Asp	Glu	Gln	Thr	Tyr	Thr	Pro	Asp	Asp	Ser
	850					855					860				

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Lys Thr Phe Trp Leu Gln Arg Ala Leu Lys Gly Ile Leu Leu Arg Ser
 865 870 875 880
 Glu Leu Tyr Gly Ala Asp Gly Ser Ser Gln Ala Asp Ile Pro Tyr Ser
 885 890 895
 Val Thr Glu Ser Arg Pro Gln Val Arg Leu Val Glu Ala Asn Gly Asp
 900 905 910
 Tyr Pro Val Val Trp Pro Met Gly Ala Glu Ser Arg Thr Ser Val Tyr
 915 920 925
 Glu Arg Tyr His Asn Asp Pro Gln Cys Gln Gln Gln Ala Val Leu Leu
 930 935 940
 Ser Asp Glu Tyr Gly Phe Pro Leu Arg Gln Val Ser Val Asn Tyr Pro
 945 950 955 960
 Arg Arg Pro Pro Ser Ala Asp Asn Pro Tyr Pro Ala Ser Leu Pro Ala
 965 970 975
 Thr Leu Phe Ala Asn Ser Tyr Asp Glu Gln Gln Gln Ile Leu Arg Leu
 980 985 990
 Gly Leu Gln Gln Ser Ser Ala His His Leu Val Ser Leu Ser Glu Gly
 995 1000 1005
 His Trp Leu Leu Gly Leu Ala Glu Ala Ser Arg Asp Asp Val Phe Thr
 1010 1015 1020
 Tyr Ser Ala Asp Asn Val Pro Glu Gly Gly Leu Thr Leu Glu His Leu
 1025 1030 1035 1040
 Leu Ala Pro Glu Ser Leu Val Ser Asp Ser Gln Val Gly Thr Leu Ala
 1045 1050 1055
 Gly Gln Gln Gln Val Trp Tyr Leu Asp Ser Gln Asp Val Ala Thr Val
 1060 1065 1070
 Ala Ala Pro Pro Leu Pro Pro Lys Val Ala Phe Ile Glu Thr Ala Val
 1075 1080 1085
 Leu Asp Glu Gly Met Val Ser Ser Leu Ala Ala Tyr Ile Val Asp Glu
 1090 1095 1100
 His Leu Glu Gln Ala Gly Tyr Arg Gln Ser Gly Tyr Leu Phe Pro Arg
 1105 1110 1115 1120
 Gly Arg Glu Ala Glu Gln Ala Leu Trp Thr Gln Cys Gln Gly Tyr Val
 1125 1130 1135
 Thr Tyr Ala Gly Ala Glu His Phe Trp Leu Pro Leu Ser Phe Arg Asp
 1140 1145 1150
 Ser Met Leu Thr Gly Pro Val Thr Val Thr Arg Asp Ala Tyr Asp Cys
 1155 1160 1165
 Val Ile Thr Gln Trp Gln Asp Ala Ala Gly Ile Val Thr Thr Ala Asp
 1170 1175 1180
 Tyr Asp Trp Arg Phe Leu Thr Pro Val Arg Val Thr Asp Pro Asn Asp
 1185 1190 1195 1200
 Asn Leu Gln Ser Val Thr Leu Asp Ala Leu Gly Arg Val Thr Thr Leu
 1205 1210 1215
 Arg Phe Trp Gly Thr Glu Asn Gly Ile Ala Thr Gly Tyr Ser Asp Ala
 1220 1225 1230
 Thr Leu Ser Val Pro Asp Gly Ala Ala Ala Ala Leu Ala Leu Thr Ala
 1235 1240 1245
 Pro Leu Pro Val Ala Gln Cys Leu Val Tyr Val Thr Asp Ser Trp Gly
 1250 1255 1260
 Asp Asp Asp Asn Glu Lys Met Pro Pro His Val Val Val Leu Ala Thr
 1265 1270 1275 1280
 Asp Arg Tyr Asp Ser Asp Thr Gly Gln Gln Val Arg Gln Gln Val Thr
 1285 1290 1295
 Phe Ser Asp Gly Phe Gly Arg Glu Leu Gln Ser Ala Thr Arg Gln Ala
 1300 1305 1310
 Glu Gly Asn Ala Trp Gln Arg Gly Arg Asp Gly Lys Leu Val Thr Ala
 1315 1320 1325
 Ser Asp Gly Leu Pro Val Thr Val Ala Thr Asn Phe Arg Trp Ala Val
 1330 1335 1340
 Thr Gly Arg Ala Glu Tyr Asp Asn Lys Gly Leu Pro Val Arg Val Tyr
 1345 1350 1355 1360
 Gln Pro Tyr Phe Leu Asp Ser Trp Gln Tyr Val Ser Asp Asp Ser Ala

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1365 1370 1375
 Arg Gln Asp Leu Tyr Ala Asp Thr His Phe Tyr Asp Pro Thr Ala Arg
 1380 1385 1390
 Glu Trp Gln Val Ile Thr Ala Lys Gly Glu Arg Arg Gln Val Leu Tyr
 1395 1400 1405
 Thr Pro Trp Phe Val Val Ser Glu Asp Glu Asn Asp Thr Val Gly Leu
 1410 1415 1420
 Asn Asp Ala Ser
 1425

<210> 6
 <211> 973
 <212> PRT
 <213> Serratia entomophila

<400> 6
 Met Ser Thr Ser Leu Phe Ser Ser Thr Pro Ser Val Ala Val Leu Asp
 1 5 10 15
 Asn Arg Gly Leu Val Arg Glu Leu Gln Tyr Tyr Arg His Pro Asp
 20 25 30
 Thr Pro Glu Glu Thr Asp Glu Arg Ile Thr Cys His Gln His Asp Glu
 35 40 45
 Arg Gly Ser Leu Ser Gln Ser Ala Asp Pro Arg Leu His Ala Ala Gly
 50 55 60
 Leu Thr Asn Phe Thr Tyr Leu Asn Ser Leu Thr Gly Thr Val Leu Gln
 65 70 75 80
 Ser Val Ser Ala Asp Ala Gly Thr Ser Leu Glu Leu Ser Asp Ala Ala
 85 90 95
 Gly Arg Ala Phe Leu Ala Val Thr Gly Ala Gly Thr Glu Asp Ala Val
 100 105 110
 Thr Arg Thr Trp Gln Tyr Glu Asp Thr Leu Pro Gly Arg Pro Leu
 115 120 125
 Ser Ile Thr Glu Gln Val Thr Gly Glu Ala Ala Gln Ile Thr Glu Arg
 130 135 140
 Phe Val Tyr Ala Gly Asn Thr Asp Ala Glu Lys Ile Leu Asn Leu Ala
 145 150 155 160
 Gly Gln Cys Val Ser His Tyr Asp Thr Ala Gly Leu Val Gln Thr Asp
 165 170 175
 Ser Ile Ala Leu Ser Gly Val Pro Leu Ala Val Thr Arg Gln Leu Leu
 180 185 190
 Pro Asp Ala Ala Gly Ala Asn Trp Met Gly Glu Asp Ala Ser Ala Trp
 195 200 205
 Asn Asp Leu Leu Asp Gly Glu Thr Phe Phe Thr Gln Thr His Ala Asp
 210 215 220
 Ala Thr Gly Ala Val Leu Ser Ile Thr Asp Ala Lys Gly Asn Leu Gln
 225 230 235 240
 Arg Val Ala Tyr Asp Val Ala Gly Leu Leu Ser Gly Ser Trp Leu Thr
 245 250 255
 Leu Lys Asp Gly Thr Glu Gln Val Ile Val Ala Ser Leu Thr Tyr Ser
 260 265 270
 Ala Ala Gly Lys Lys Leu Arg Glu Glu His Gly Asn Gly Val Val Thr
 275 280 285
 Ser Tyr Ile Tyr Glu Pro Glu Thr Gln Arg Leu Thr Gly Ile Lys Thr
 290 295 300
 Glu Arg Pro Ser Gly His Val Ala Gly Ala Lys Val Leu Gln Asp Leu
 305 310 315 320
 Arg Tyr Thr Tyr Asp Pro Val Gly Asn Val Leu Ser Val Asn Asn Asp
 325 330 335
 Ala Glu Glu Thr Arg Phe Trp Arg Asn Gln Lys Val Val Pro Glu Asn
 340 345 350
 Thr Tyr Ile Tyr Asp Ser Leu Tyr Gln Leu Val Ser Ala Thr Gly Arg
 355 360 365

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Glu	Met	Ala	Asn	Ala	Gly	Gln	Gln	Gly	Asn	Asp	Leu	Pro	Ser	Ala	Thr
370						375					380				
Ala	Pro	Leu	Pro	Thr	Asp	Ser	Ser	Ala	Tyr	Thr	Asn	Tyr	Thr	Arg	Thr
385					390					395					400
Tyr	Arg	Tyr	Asp	Arg	Gly	Gly	Asn	Leu	Thr	Gln	Met	Arg	His	Ser	Ala
				405					410					415	
Pro	Ala	Thr	Asn	Asn	Asn	Tyr	Thr	Thr	Asp	Ile	Thr	Val	Ser	Asp	Arg
				420				425					430		
Ser	Asn	Arg	Ala	Val	Leu	Ser	Thr	Leu	Ala	Glu	Val	Pro	Ser	Asp	Val
		435					440					445			
Asp	Met	Leu	Phe	Ser	Ala	Gly	Gly	His	Gln	Lys	His	Leu	Gln	Pro	Gly
450						455					460				
Gln	Ala	Leu	Val	Trp	Thr	Pro	Arg	Gly	Glu	Leu	Gln	Lys	Val	Thr	Pro
465					470					475					480
Val	Val	Arg	Asp	Gly	Gly	Ala	Asp	Asp	Ser	Glu	Ser	Tyr	Arg	Tyr	Asp
				485					490					495	
Ala	Gly	Ser	Gln	Arg	Ile	Ile	Lys	Thr	Gly	Thr	Arg	Gln	Thr	Gly	Asn
			500					505					510		
Asn	Val	Gln	Thr	Gln	Arg	Val	Val	Tyr	Leu	Pro	Gly	Leu	Glu	Leu	Arg
		515					520					525			
Ile	Met	Ala	Asn	Gly	Val	Thr	Glu	Lys	Glu	Ser	Leu	Gln	Val	Ile	Thr
530						535					540				
Val	Gly	Glu	Ala	Gly	Arg	Ala	Gln	Val	Arg	Val	Leu	His	Trp	Glu	Ile
545					550					555					560
Gly	Lys	Pro	Asp	Asp	Leu	Asp	Glu	Asp	Ser	Val	Arg	Tyr	Ser	Tyr	Asp
				565					570					575	
Asn	Leu	Val	Gly	Ser	Ser	Gln	Leu	Glu	Leu	Asp	Arg	Glu	Gly	Tyr	Leu
			580					585					590		
Ile	Ser	Glu	Glu	Glu	Phe	Tyr	Pro	Tyr	Gly	Gly	Thr	Ala	Val	Leu	Thr
		595					600					605			
Ala	Arg	Ser	Glu	Val	Glu	Ala	Asp	Tyr	Lys	Thr	Ile	Arg	Tyr	Ser	Gly
610						615					620				
Lys	Glu	Arg	Asp	Ala	Thr	Gly	Leu	Asp	Tyr	Tyr	Gly	Tyr	Arg	Tyr	Tyr
625					630					635					640
Gln	Pro	Trp	Ala	Gly	Arg	Trp	Leu	Ser	Thr	Asp	Pro	Ala	Gly	Thr	Val
				645					650					655	
Asp	Gly	Leu	Asn	Leu	Phe	Arg	Met	Val	Arg	Asn	Asn	Pro	Val	Thr	Leu
			660					665					670		
Phe	Asp	Ser	Asn	Gly	Arg	Ile	Ser	Thr	Gly	Gln	Glu	Ala	Arg	Arg	Leu
		675					680					685			
Val	Gly	Glu	Ala	Phe	Val	His	Pro	Leu	His	Met	Pro	Val	Phe	Glu	Arg
690						695					700				
Ile	Ser	Val	Glu	Arg	Lys	Ile	Ser	Met	Ser	Val	Arg	Glu	Ala	Gly	Ile
705					710					715					720
Tyr	Thr	Ile	Ser	Ala	Leu	Gly	Glu	Gly	Ala	Ala	Ala	Lys	Gly	His	Asn
				725					730					735	
Ile	Leu	Glu	Lys	Thr	Ile	Lys	Pro	Gly	Ser	Leu	Lys	Ala	Ile	Tyr	Gly
			740					745					750		
Asp	Lys	Ala	Glu	Ser	Ile	Leu	Gly	Leu	Ala	Lys	Arg	Ser	Gly	Leu	Val
		755					760					765			
Gly	Arg	Val	Gly	Gln	Trp	Asp	Ala	Ser	Gly	Val	Arg	Gly	Ile	Tyr	Ala
770						775					780				
His	Asn	Arg	Pro	Gly	Gly	Glu	Asp	Leu	Val	Tyr	Pro	Val	Ser	Leu	Gln
785					790					795					800
Asn	Thr	Ser	Ala	Asn	Glu	Ile	Val	Asn	Ala	Trp	Ile	Lys	Phe	Lys	Ile
				805					810					815	
Ile	Thr	Pro	Tyr	Thr	Gly	Asp	Tyr	Asp	Met	His	Asp	Ile	Ile	Lys	Phe
			820					825					830		
Ser	Asp	Gly	Lys	Gly	His	Val	Pro	Thr	Ala	Glu	Ser	Ser	Glu	Glu	Arg
		835					840					845			
Gly	Val	Lys	Asp	Leu	Ile	Asn	Lys	Gly	Val	Ala	Glu	Val	Asp	Pro	Ser
850						855					860				
Arg	Pro	Phe	Glu	Tyr	Thr	Ala	Met	Asn	Val	Ile	Arg	His	Gly	Pro	Gln

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865      870      875      880
Val Asn Phe Val Pro Tyr Met Trp Glu His Glu His Asp Lys Val Val
      885      890      895
Asn Asp Asn Gly Tyr Leu Gly Val Val Ala Ser Pro Gly Pro Phe Pro
      900      905      910
Val Ala Met Val His Gln Gly Glu Trp Thr Val Phe Asp Asn Ser Glu
      915      920      925
Glu Leu Phe Asn Phe Tyr Lys Ser Thr Asn Thr Pro Leu Pro Glu His
      930      935      940
Trp Ser Gln Asp Phe Met Asp Arg Gly Lys Gly Ile Val Ala Thr Pro
      945      950      955      960
Arg His Ala Glu Leu Leu Asp Lys Arg Arg Val Met Tyr
      965      970

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<210> 7
 <211> 2516
 <212> PRT
 <213> Photorhabdus luminescens

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<400> 7
Met Asn Glu Ser Val Lys Glu Ile Pro Asp Val Leu Lys Ser Gln Cys
 1      5      10      15
Gly Phe Asn Cys Leu Thr Asp Ile Ser His Ser Ser Phe Asn Glu Phe
      20      25      30
Arg Gln Gln Val Ser Glu His Leu Ser Trp Ser Glu Thr His Asp Leu
      35      40      45
Tyr His Asp Ala Gln Gln Ala Gln Lys Asp Asn Arg Leu Tyr Glu Ala
      50      55      60
Arg Ile Leu Lys Arg Ala Asn Pro Gln Leu Gln Asn Ala Val His Leu
      65      70      75      80
Ala Ile Leu Ala Pro Asn Ala Glu Leu Ile Gly Tyr Asn Asn Gln Phe
      85      90      95
Ser Gly Arg Ala Ser Gln Tyr Val Ala Pro Gly Thr Val Ser Ser Met
      100      105      110
Phe Ser Pro Ala Ala Tyr Leu Thr Glu Leu Tyr Arg Glu Ala Arg Asn
      115      120      125
Leu His Ala Ser Asp Ser Val Tyr Tyr Leu Asp Thr Arg Arg Pro Asp
      130      135      140
Leu Lys Ser Met Ala Leu Ser Gln Gln Asn Met Asp Ile Glu Leu Ser
      145      150      155      160
Thr Leu Ser Leu Ser Asn Glu Leu Leu Leu Glu Ser Ile Lys Thr Glu
      165      170      175
Ser Lys Leu Glu Asn Tyr Thr Lys Val Met Glu Met Leu Ser Thr Phe
      180      185      190
Arg Pro Ser Gly Ala Thr Pro Tyr His Asp Ala Tyr Glu Asn Val Arg
      195      200      205
Glu Val Ile Gln Leu Gln Asp Pro Gly Leu Glu Gln Leu Asn Ala Ser
      210      215      220
Pro Ala Ile Ala Gly Leu Met His Gln Ala Ser Leu Leu Gly Ile Asn
      225      230      235      240
Ala Ser Ile Ser Pro Glu Leu Phe Asn Ile Leu Thr Glu Glu Ile Thr
      245      250      255
Glu Gly Asn Ala Glu Glu Leu Tyr Lys Lys Asn Phe Gly Asn Ile Glu
      260      265      270
Pro Ala Ser Leu Ala Met Pro Glu Tyr Leu Lys Arg Tyr Asn Leu
      275      280      285
Ser Asp Glu Glu Leu Ser Gln Phe Ile Gly Lys Ala Ser Asn Phe Gly
      290      295      300
Gln Gln Glu Tyr Ser Asn Asn Gln Leu Ile Thr Pro Val Val Asn Ser
      305      310      315      320
Ser Asp Gly Thr Val Lys Val Tyr Arg Ile Thr Arg Glu Tyr Thr Thr
      325      330      335

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24727-1104 saved September 12 2005.txt

Asn	Ala	Tyr	Gln	Met	Asp	Val	Glu	Leu	Phe	Pro	Phe	Gly	Gly	Glu	Asn
			340					345					350		
Tyr	Arg	Leu	Asp	Tyr	Lys	Phe	Lys	Asn	Phe	Tyr	Asn	Ala	Ser	Tyr	Leu
		355					360					365			
Ser	Ile	Lys	Leu	Asn	Asp	Lys	Arg	Glu	Leu	Val	Arg	Thr	Glu	Gly	Ala
	370					375					380				
Pro	Gln	Val	Asn	Ile	Glu	Tyr	Ser	Ala	Asn	Ile	Thr	Leu	Asn	Thr	Ala
385					390					395					400
Asp	Ile	Ser	Gln	Pro	Phe	Glu	Ile	Gly	Leu	Thr	Arg	Val	Leu	Pro	Ser
				405					410					415	
Gly	Ser	Trp	Ala	Tyr	Ala	Ala	Ala	Lys	Phe	Thr	Val	Glu	Glu	Tyr	Asn
			420					425					430		
Gln	Tyr	Ser	Phe	Leu	Leu	Lys	Leu	Asn	Lys	Ala	Ile	Arg	Leu	Ser	Arg
		435					440					445			
Ala	Thr	Glu	Leu	Ser	Pro	Thr	Ile	Leu	Glu	Gly	Ile	Val	Arg	Ser	Val
	450					455					460				
Asn	Leu	Gln	Leu	Asp	Ile	Asn	Thr	Asp	Val	Leu	Gly	Lys	Val	Phe	Leu
465					470					475					480
Thr	Lys	Tyr	Tyr	Met	Gln	Arg	Tyr	Ala	Ile	His	Ala	Glu	Thr	Ala	Leu
				485					490					495	
Ile	Leu	Cys	Asn	Ala	Pro	Ile	Ser	Gln	Arg	Ser	Tyr	Asp	Asn	Gln	Pro
			500					505					510		
Ser	Gln	Phe	Asp	Arg	Leu	Phe	Asn	Thr	Pro	Leu	Leu	Asn	Gly	Gln	Tyr
		515					520					525			
Phe	Ser	Thr	Gly	Asp	Glu	Glu	Ile	Asp	Leu	Asn	Ser	Gly	Ser	Thr	Gly
	530				535						540				
Asp	Trp	Arg	Lys	Thr	Ile	Leu	Lys	Arg	Ala	Phe	Asn	Ile	Asp	Asp	Val
545					550					555					560
Ser	Leu	Phe	Arg	Leu	Leu	Lys	Ile	Thr	Asp	His	Asp	Asn	Lys	Asp	Gly
				565					570					575	
Lys	Ile	Lys	Asn	Asn	Leu	Lys	Asn	Leu	Ser	Asn	Leu	Tyr	Ile	Gly	Lys
			580				585						590		
Leu	Leu	Ala	Asp	Ile	His	Gln	Leu	Thr	Ile	Asp	Glu	Leu	Asp	Leu	Leu
		595					600					605			
Leu	Ile	Ala	Val	Gly	Glu	Gly	Lys	Thr	Asn	Leu	Ser	Ala	Ile	Ser	Asp
	610				615						620				
Lys	Gln	Leu	Ala	Thr	Leu	Ile	Arg	Lys	Leu	Asn	Thr	Ile	Thr	Ser	Trp
625					630					635					640
Leu	His	Thr	Gln	Lys	Trp	Ser	Val	Phe	Gln	Leu	Phe	Ile	Met	Thr	Ser
				645					650					655	
Thr	Ser	Tyr	Asn	Lys	Thr	Leu	Thr	Pro	Glu	Ile	Lys	Asn	Leu	Leu	Asp
			660					665					670		
Thr	Val	Tyr	His	Gly	Leu	Gln	Gly	Phe	Asp	Lys	Asp	Lys	Ala	Asp	Leu
		675					680					685			
Leu	His	Val	Met	Ala	Pro	Tyr	Ile	Ala	Ala	Thr	Leu	Gln	Leu	Ser	Ser
	690					695					700				
Glu	Asn	Val	Ala	His	Ser	Val	Leu	Leu	Trp	Ala	Asp	Lys	Leu	Gln	Pro
705					710					715					720
Gly	Asp	Gly	Ala	Met	Thr	Ala	Glu	Lys	Phe	Trp	Asp	Trp	Leu	Asn	Thr
				725					730					735	
Lys	Tyr	Thr	Pro	Gly	Ser	Ser	Glu	Ala	Val	Glu	Thr	Gln	Glu	His	Ile
			740					745					750		
Val	Gln	Tyr	Cys	Gln	Ala	Leu	Ala	Gln	Leu	Glu	Met	Val	Tyr	His	Ser
		755					760					765			
Thr	Gly	Ile	Asn	Glu	Asn	Ala	Phe	Arg	Leu	Phe	Val	Thr	Lys	Pro	Glu
	770					775					780				
Met	Phe	Gly	Ala	Ala	Thr	Gly	Ala	Ala	Pro	Ala	His	Asp	Ala	Leu	Ser
785					790					795					800
Leu	Ile	Met	Leu	Thr	Arg	Phe	Ala	Asp	Trp	Val	Asn	Ala	Leu	Gly	Glu
				805					810					815	
Lys	Ala	Ser	Ser	Val	Leu	Ala	Ala	Phe	Glu	Ala	Asn	Ser	Leu	Thr	Ala
			820					825					830		
Glu	Gln	Leu	Ala	Asp	Ala	Met	Asn	Leu	Asp	Ala	Asn	Leu	Leu	Leu	Gln

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835 840 845
 Ala Ser Ile Gln Ala Gln Asn His Gln His Leu Pro Pro Val Thr Pro
 850 855 860
 Glu Asn Ala Phe Ser Cys Trp Thr Ser Ile Asn Thr Ile Leu Gln Trp
 865 870 875 880
 Val Asn Val Ala Gln Gln Leu Asn Val Ala Pro Gln Gly Val Ser Ala
 885 890 895
 Leu Val Gly Leu Asp Tyr Ile Gln Ser Met Lys Glu Thr Pro Thr Tyr
 900 905 910
 Ala Gln Trp Glu Asn Ala Ala Gly Val Leu Thr Ala Gly Leu Asn Ser
 915 920 925
 Gln Gln Ala Asn Thr Leu His Ala Phe Leu Asp Glu Ser Arg Ser Ala
 930 935 940
 Ala Leu Ser Thr Tyr Tyr Ile Arg Gln Val Ala Lys Ala Ala Ala Ala
 945 950 955 960
 Ile Lys Ser Arg Asp Asp Leu Tyr Gln Tyr Leu Leu Ile Asp Asn Gln
 965 970 975
 Val Ser Ala Ala Ile Lys Thr Thr Arg Ile Ala Glu Ala Ile Ala Ser
 980 985 990
 Ile Gln Leu Tyr Val Asn Arg Ala Leu Glu Asn Val Glu Glu Asn Ala
 995 1000 1005
 Asn Ser Gly Val Ile Ser Arg Gln Phe Phe Ile Asp Trp Asp Lys Tyr
 1010 1015 1020
 Asn Lys Arg Tyr Ser Thr Trp Ala Gly Val Ser Gln Leu Val Tyr Tyr
 1025 1030 1035 1040
 Pro Glu Asn Tyr Ile Asp Pro Thr Met Arg Ile Gly Gln Thr Lys Met
 1045 1050 1055
 Met Asp Ala Leu Leu Gln Ser Val Ser Gln Ser Gln Leu Asn Ala Asp
 1060 1065 1070
 Thr Val Glu Asp Ala Phe Met Ser Tyr Leu Thr Ser Phe Glu Gln Val
 1075 1080 1085
 Ala Asn Leu Lys Val Ile Ser Ala Tyr His Asp Asn Ile Asn Asn Asp
 1090 1095 1100
 Gln Gly Leu Thr Tyr Phe Ile Gly Leu Ser Glu Thr Asp Ala Gly Glu
 1105 1110 1115 1120
 Tyr Tyr Trp Arg Ser Val Asp His Ser Lys Phe Asn Asp Gly Lys Phe
 1125 1130 1135
 Ala Ala Asn Ala Trp Ser Glu Trp His Lys Ile Asp Cys Pro Ile Asn
 1140 1145 1150
 Pro Tyr Lys Ser Thr Ile Arg Pro Val Ile Tyr Lys Ser Arg Leu Tyr
 1155 1160 1165
 Leu Leu Trp Leu Glu Gln Lys Glu Ile Thr Lys Gln Thr Gly Asn Ser
 1170 1175 1180
 Lys Asp Gly Tyr Gln Thr Glu Thr Asp Tyr Arg Tyr Glu Leu Lys Leu
 1185 1190 1195 1200
 Ala His Ile Arg Tyr Asp Gly Thr Trp Asn Thr Pro Ile Thr Phe Asp
 1205 1210 1215
 Val Asn Lys Lys Ile Ser Glu Leu Lys Leu Glu Lys Asn Arg Ala Pro
 1220 1225 1230
 Gly Leu Tyr Cys Ala Gly Tyr Gln Gly Glu Asp Thr Leu Leu Val Met
 1235 1240 1245
 Phe Tyr Asn Gln Gln Asp Thr Leu Asp Ser Tyr Lys Asn Ala Ser Met
 1250 1255 1260
 Gln Gly Leu Tyr Ile Phe Ala Asp Met Ala Ser Lys Asp Met Thr Pro
 1265 1270 1275 1280
 Glu Gln Ser Asn Val Tyr Arg Asp Asn Ser Tyr Gln Gln Phe Asp Thr
 1285 1290 1295
 Asn Asn Val Arg Arg Val Asn Asn Arg Tyr Ala Glu Asp Tyr Glu Ile
 1300 1305 1310
 Pro Ser Ser Val Ser Ser Arg Lys Asp Tyr Gly Trp Gly Asp Tyr Tyr
 1315 1320 1325
 Leu Ser Met Val Tyr Asn Gly Asp Ile Pro Thr Ile Asn Tyr Lys Ala
 1330 1335 1340

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Ala Ser Ser Asp Leu Lys Ile Tyr Ile Ser Pro Lys Leu Arg Ile Ile
1345 1350 1355 1360
His Asn Gly Tyr Glu Gly Gln Lys Arg Asn Gln Cys Asn Leu Met Asn
1365 1370 1375
Lys Tyr Gly Lys Leu Gly Asp Lys Phe Ile Val Tyr Thr Ser Leu Gly
1380 1385 1390
Val Asn Pro Asn Asn Ser Ser Asn Lys Leu Met Phe Tyr Pro Val Tyr
1395 1400 1405
Gln Tyr Ser Gly Asn Thr Ser Gly Leu Asn Gln Gly Arg Leu Leu Phe
1410 1415 1420
His Arg Asp Thr Thr Tyr Pro Ser Lys Val Glu Ala Trp Ile Pro Gly
1425 1430 1435 1440
Ala Lys Arg Ser Leu Thr Asn Gln Asn Ala Ala Ile Gly Asp Asp Tyr
1445 1450 1455
Ala Thr Asp Ser Leu Asn Lys Pro Asp Asp Leu Lys Gln Tyr Ile Phe
1460 1465 1470
Met Thr Asp Ser Lys Gly Thr Ala Thr Asp Val Ser Gly Pro Val Glu
1475 1480 1485
Ile Asn Thr Ala Ile Ser Pro Ala Lys Val Gln Ile Ile Val Lys Ala
1490 1495 1500
Gly Gly Lys Glu Gln Thr Phe Thr Ala Asp Lys Asp Val Ser Ile Gln
1505 1510 1515 1520
Pro Ser Pro Ser Phe Asp Glu Met Asn Tyr Gln Phe Asn Ala Leu Glu
1525 1530 1535
Ile Asp Gly Ser Gly Leu Asn Phe Ile Asn Asn Ser Ala Ser Ile Asp
1540 1545 1550
Val Thr Phe Thr Ala Phe Ala Glu Asp Gly Arg Lys Leu Gly Tyr Glu
1555 1560 1565
Ser Phe Ser Ile Pro Val Thr Leu Lys Val Ser Thr Asp Asn Ala Leu
1570 1575 1580
Thr Leu His His Asn Glu Asn Gly Ala Gln Tyr Met Gln Trp Gln Ser
1585 1590 1595 1600
Tyr Arg Thr Arg Leu Asn Thr Leu Phe Ala Arg Gln Leu Val Ala Arg
1605 1610 1615
Ala Thr Thr Gly Ile Asp Thr Ile Leu Ser Met Glu Thr Gln Asn Ile
1620 1625 1630
Gln Glu Pro Gln Leu Gly Lys Gly Phe Tyr Ala Thr Phe Val Ile Pro
1635 1640 1645
Pro Tyr Asn Leu Ser Thr His Gly Asp Glu Arg Trp Phe Lys Leu Tyr
1650 1655 1660
Ile Lys His Val Val Asp Asn Asn Ser His Ile Ile Tyr Ser Gly Gln
1665 1670 1675 1680
Leu Thr Asp Thr Asn Ile Asn Ile Thr Leu Phe Ile Pro Leu Asp Asp
1685 1690 1695
Val Pro Leu Asn Gln Asp Tyr His Ala Lys Val Tyr Met Thr Phe Lys
1700 1705 1710
Lys Ser Pro Ser Asp Gly Thr Trp Trp Gly Pro His Phe Val Arg Asp
1715 1720 1725
Asp Lys Gly Ile Val Thr Ile Asn Pro Lys Ser Ile Leu Thr His Phe
1730 1735 1740
Glu Ser Val Asn Val Leu Asn Asn Ile Ser Ser Glu Pro Met Asp Phe
1745 1750 1755 1760
Ser Gly Ala Asn Ser Leu Tyr Phe Trp Glu Leu Phe Tyr Tyr Thr Pro
1765 1770 1775
Met Leu Val Ala Gln Arg Leu Leu His Glu Gln Asn Phe Asp Glu Ala
1780 1785 1790
Asn Arg Trp Leu Lys Tyr Val Trp Ser Pro Ser Gly Tyr Ile Val His
1795 1800 1805
Gly Gln Ile Gln Asn Tyr Gln Trp Asn Val Arg Pro Leu Leu Glu Asp
1810 1815 1820
Thr Ser Trp Asn Ser Asp Pro Leu Asp Ser Val Asp Pro Asp Ala Val
1825 1830 1835 1840
Ala Gln His Asp Pro Met His Tyr Lys Val Ser Thr Phe Met Arg Thr

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1845 1850 1855
 Leu Asp Leu Leu Ile Ala Arg Gly Asp His Ala Tyr Arg Gln Leu Glu
 1860 1865 1870
 Arg Asp Thr Leu Asn Glu Ala Lys Met Trp Tyr Met Gln Ala Leu His
 1875 1880 1885
 Leu Leu Gly Asp Lys Pro Tyr Leu Pro Leu Ser Thr Thr Trp Ser Asp
 1890 1895 1900
 Pro Arg Leu Asp Arg Ala Ala Asp Ile Thr Thr Gln Asn Ala His Asp
 1905 1910 1915 1920
 Ser Ala Ile Val Ala Leu Arg Gln Asn Ile Pro Thr Pro Ala Pro Leu
 1925 1930 1935
 Ser Leu Arg Ser Ala Asn Thr Leu Thr Asp Leu Phe Leu Pro Gln Ile
 1940 1945 1950
 Asn Glu Val Met Met Asn Tyr Trp Gln Thr Leu Ala Gln Arg Val Tyr
 1955 1960 1965
 Asn Leu Arg His Asn Leu Ser Ile Asp Gly Gln Pro Leu Tyr Leu Pro
 1970 1975 1980
 Ile Tyr Ala Thr Pro Ala Asp Pro Lys Ala Leu Leu Ser Ala Ala Val
 1985 1990 1995 2000
 Ala Thr Ser Gln Gly Gly Lys Leu Pro Glu Ser Phe Met Ser Leu
 2005 2010 2015
 Trp Arg Phe Pro His Met Leu Glu Asn Ala Arg Gly Met Val Ser Gln
 2020 2025 2030
 Leu Thr Gln Phe Gly Ser Thr Leu Gln Asn Ile Ile Glu Arg Gln Asp
 2035 2040 2045
 Ala Glu Ala Leu Asn Ala Leu Leu Gln Asn Gln Ala Ala Glu Leu Ile
 2050 2055 2060
 Leu Thr Asn Leu Ser Ile Gln Asp Lys Thr Ile Glu Glu Leu Asp Ala
 2065 2070 2075 2080
 Glu Lys Thr Val Leu Glu Lys Ser Lys Ala Gly Ala Gln Ser Arg Phe
 2085 2090 2095
 Asp Ser Tyr Gly Lys Leu Tyr Asp Glu Asn Ile Asn Ala Gly Glu Asn
 2100 2105 2110
 Gln Ala Met Thr Leu Arg Ala Ser Ala Ala Gly Leu Thr Thr Ala Val
 2115 2120 2125
 Gln Ala Ser Arg Leu Ala Gly Ala Ala Ala Asp Leu Val Pro Asn Ile
 2130 2135 2140
 Phe Gly Phe Ala Gly Gly Ser Arg Trp Gly Ala Ile Ala Glu Ala
 2145 2150 2155 2160
 Thr Gly Tyr Val Met Glu Phe Ser Ala Asn Val Met Asn Thr Glu Ala
 2165 2170 2175
 Asp Lys Ile Ser Gln Ser Glu Thr Tyr Arg Arg Arg Arg Gln Glu Trp
 2180 2185 2190
 Glu Ile Gln Arg Asn Asn Ala Glu Ala Glu Leu Lys Gln Ile Asp Ala
 2195 2200 2205
 Gln Leu Lys Ser Leu Ala Val Arg Arg Glu Ala Ala Val Leu Gln Lys
 2210 2215 2220
 Thr Ser Leu Lys Thr Gln Gln Glu Gln Thr Gln Ser Gln Leu Ala Phe
 2225 2230 2235 2240
 Leu Gln Arg Lys Phe Ser Asn Gln Ala Leu Tyr Asn Trp Leu Arg Gly
 2245 2250 2255
 Arg Leu Ala Ala Ile Tyr Phe Gln Phe Tyr Asp Leu Ala Val Ala Arg
 2260 2265 2270
 Cys Leu Met Ala Glu Gln Ala Tyr Arg Trp Glu Leu Asn Asp Asp Ser
 2275 2280 2285
 Ala Arg Phe Ile Lys Pro Gly Ala Trp Gln Gly Thr Tyr Ala Gly Leu
 2290 2295 2300
 Leu Ala Gly Glu Thr Leu Met Leu Ser Leu Ala Gln Met Glu Asp Ala
 2305 2310 2315 2320
 His Leu Lys Arg Asp Lys Arg Ala Leu Glu Val Glu Arg Thr Val Ser
 2325 2330 2335
 Leu Ala Glu Val Tyr Ala Gly Leu Pro Lys Asp Asn Gly Pro Phe Ser
 2340 2345 2350

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Leu	Ala	Gln	Glu	Ile	Asp	Lys	Leu	Val	Ser	Gln	Gly	Ser	Gly	Ser	Ala
	2355						2360					2365			
Gly	Ser	Gly	Asn	Asn	Asn	Leu	Ala	Phe	Gly	Ala	Gly	Thr	Asp	Thr	Lys
	2370						2375					2380			
Thr	Ser	Leu	Gln	Ala	Ser	Val	Ser	Phe	Ala	Asp	Leu	Lys	Ile	Arg	Glu
2385					2390					2395					2400
Asp	Tyr	Pro	Ala	Ser	Leu	Gly	Lys	Ile	Arg	Arg	Ile	Lys	Gln	Ile	Ser
				2405					2410					2415	
Val	Thr	Leu	Pro	Ala	Leu	Leu	Gly	Pro	Tyr	Gln	Asp	Val	Gln	Ala	Ile
			2420					2425					2430		
Leu	Ser	Tyr	Gly	Asp	Lys	Ala	Gly	Leu	Ala	Asn	Gly	Cys	Glu	Ala	Leu
	2435						2440					2445			
Ala	Val	Ser	His	Gly	Met	Asn	Asp	Ser	Gly	Gln	Phe	Gln	Leu	Asp	Phe
	2450						2455				2460				
Asn	Asp	Gly	Lys	Phe	Leu	Pro	Phe	Glu	Gly	Ile	Ala	Ile	Asp	Gln	Gly
2465					2470					2475					2480
Thr	Leu	Thr	Leu	Ser	Phe	Pro	Asn	Ala	Ser	Met	Pro	Glu	Lys	Gly	Lys
				2485					2490					2495	
Gln	Ala	Thr	Met	Leu	Lys	Thr	Leu	Asn	Asp	Ile	Ile	Leu	His	Ile	Arg
			2500					2505					2510		
Tyr	Thr	Ile	Lys												
		2515													

<210> 8
 <211> 1189
 <212> PRT
 <213> Photorhabdus luminescens

<400> 8

Met	Ser	Glu	Ser	Leu	Phe	Thr	Gln	Thr	Leu	Lys	Glu	Ala	Arg	Arg	Asp
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Ala	Leu	Val	Ala	His	Tyr	Ile	Ala	Thr	Gln	Val	Pro	Ala	Asp	Leu	Lys
			20					25					30		
Glu	Ser	Ile	Gln	Thr	Ala	Asp	Asp	Leu	Tyr	Glu	Tyr	Leu	Leu	Leu	Asp
		35					40					45			
Thr	Lys	Ile	Ser	Asp	Leu	Val	Thr	Thr	Ser	Pro	Leu	Ser	Glu	Ala	Ile
	50					55					60				
Gly	Ser	Leu	Gln	Leu	Phe	Ile	His	Arg	Ala	Ile	Glu	Gly	Tyr	Asp	Gly
65					70				75					80	
Thr	Leu	Ala	Asp	Ser	Ala	Lys	Pro	Tyr	Phe	Ala	Asp	Glu	Gln	Phe	Leu
				85					90					95	
Tyr	Asn	Trp	Asp	Ser	Phe	Asn	His	Arg	Tyr	Ser	Thr	Trp	Ala	Gly	Lys
			100					105					110		
Glu	Arg	Leu	Lys	Phe	Tyr	Ala	Gly	Asp	Tyr	Ile	Asp	Pro	Thr	Leu	Arg
		115					120					125			
Leu	Asn	Lys	Thr	Glu	Ile	Phe	Thr	Ala	Phe	Glu	Gln	Gly	Ile	Ser	Gln
	130					135					140				
Gly	Lys	Leu	Lys	Ser	Glu	Leu	Val	Glu	Ser	Lys	Leu	Arg	Asp	Tyr	Leu
145					150					155					160
Ile	Ser	Tyr	Asp	Thr	Leu	Ala	Thr	Leu	Asp	Tyr	Ile	Thr	Ala	Cys	Gln
			165						170					175	
Gly	Lys	Asp	Asn	Lys	Thr	Ile	Phe	Phe	Ile	Gly	Arg	Thr	Gln	Asn	Ala
			180					185					190		
Pro	Tyr	Ala	Phe	Tyr	Trp	Arg	Lys	Leu	Thr	Leu	Val	Thr	Asp	Gly	Gly
		195					200					205			
Lys	Leu	Lys	Pro	Asp	Gln	Trp	Ser	Glu	Trp	Arg	Ala	Ile	Asn	Ala	Gly
	210					215					220				
Ile	Ser	Glu	Ala	Tyr	Ser	Gly	His	Val	Glu	Pro	Phe	Trp	Glu	Asn	Asn
225					230					235					240
Lys	Leu	His	Ile	Arg	Trp	Phe	Thr	Ile	Ser	Lys	Glu	Asp	Lys	Ile	Asp
			245						250					255	
Phe	Val	Tyr	Lys	Asn	Ile	Trp	Val	Met	Ser	Ser	Asp	Tyr	Ser	Trp	Ala

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260 265 270
 Ser Lys Lys Lys Ile Leu Glu Leu Ser Phe Thr Asp Tyr Asn Arg Val
 275 280 285
 Gly Ala Thr Gly Ser Ser Ser Pro Thr Glu Val Ala Ser Gln Tyr Gly
 290 295 300
 Ser Asp Ala Gln Met Asn Ile Ser Asp Asp Gly Thr Val Leu Ile Phe
 305 310 315 320
 Gln Asn Ala Gly Gly Ala Thr Pro Ser Thr Gly Val Thr Leu Cys Tyr
 325 330 335
 Asp Ser Gly Asn Val Ile Lys Asn Leu Ser Ser Thr Gly Ser Ala Asn
 340 345 350
 Leu Ser Ser Lys Asp Tyr Ala Thr Thr Lys Leu Arg Met Cys His Gly
 355 360 365
 Gln Ser Tyr Asn Asp Asn Asn Tyr Cys Asn Phe Thr Leu Ser Ile Asn
 370 375 380
 Thr Ile Glu Phe Thr Ser Tyr Gly Thr Phe Ser Ser Asp Gly Lys Gln
 385 390 395 400
 Phe Thr Pro Pro Ser Gly Ser Ala Ile Asp Leu His Leu Pro Asn Tyr
 405 410 415
 Val Asp Leu Asn Ala Leu Leu Asp Ile Ser Leu Asp Ser Leu Leu Asn
 420 425 430
 Tyr Asp Val Gln Gly Gln Phe Gly Gly Ser Asn Pro Val Asp Asn Phe
 435 440 445
 Ser Gly Pro Tyr Gly Ile Tyr Leu Trp Glu Ile Phe Phe His Ile Pro
 450 455 460
 Phe Leu Val Thr Val Arg Met Gln Thr Glu Gln Arg Tyr Glu Asp Ala
 465 470 475 480
 Asp Thr Trp Tyr Lys Tyr Ile Phe Arg Ser Ala Gly Tyr Arg Asp Ala
 485 490 495
 Asn Gly Gln Leu Ile Met Asp Gly Ser Lys Pro Arg Tyr Trp Asn Val
 500 505 510
 Met Pro Leu Gln Leu Asp Thr Ala Trp Asp Thr Thr Gln Pro Ala Thr
 515 520 525
 Thr Asp Pro Asp Val Ile Ala Met Ala Asp Pro Met His Tyr Lys Leu
 530 535 540
 Ala Ile Phe Leu His Thr Leu Asp Leu Leu Ile Ala Arg Gly Asp Ser
 545 550 555 560
 Ala Tyr Arg Gln Leu Glu Arg Asp Thr Leu Val Glu Ala Lys Met Tyr
 565 570 575
 Tyr Ile Gln Ala Gln Gln Leu Leu Gly Pro Arg Pro Asp Ile His Thr
 580 585 590
 Thr Asn Thr Trp Pro Asn Pro Thr Leu Ser Lys Glu Ala Gly Ala Ile
 595 600 605
 Ala Thr Pro Thr Phe Leu Ser Ser Pro Glu Val Met Thr Phe Ala Ala
 610 615 620
 Trp Leu Ser Ala Gly Asp Thr Ala Asn Ile Gly Asp Gly Asp Phe Leu
 625 630 635 640
 Pro Pro Tyr Asn Asp Val Leu Leu Gly Tyr Trp Asp Lys Leu Glu Leu
 645 650 655
 Arg Leu Tyr Asn Leu Arg His Asn Leu Ser Leu Asp Gly Gln Pro Leu
 660 665 670
 Asn Leu Pro Leu Tyr Ala Thr Pro Val Asp Pro Lys Thr Leu Gln Arg
 675 680 685
 Gln Gln Ala Gly Gly Asp Gly Thr Gly Ser Ser Pro Ala Gly Gly Gln
 690 695 700
 Gly Ser Val Gln Gly Trp Arg Tyr Pro Leu Leu Val Glu Arg Ala Arg
 705 710 715 720
 Ser Ala Val Ser Leu Leu Thr Gln Phe Gly Asn Ser Leu Gln Thr Thr
 725 730 735
 Leu Glu His Gln Asp Asn Glu Lys Met Thr Leu Leu Leu Gln Thr Gln
 740 745 750
 Gln Gln Ala Ile Leu Lys Gln Gln His Asp Ile Gln Gln Asn Asn Leu
 755 760 765

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Lys Gly Leu Gln His Ser Leu Thr Ala Leu Gln Ala Ser Arg Asp Gly
 770 775 780
 Ala Thr Leu Arg Gln Lys His Tyr Ser Asp Leu Ile Asn Gly Gly Leu
 785 790 795 800
 Ser Ala Ala Glu Ile Ala Gly Leu Thr Leu Arg Ser Thr Ala Met Ile
 805 810 815
 Thr Asn Gly Val Ala Thr Gly Leu Leu Ile Ala Gly Gly Ile Ala Asn
 820 825 830
 Ala Val Pro Asn Val Phe Gly Leu Ala Asn Gly Gly Ser Glu Trp Gly
 835 840 845
 Ala Pro Leu Ile Gly Ser Gly Gln Ala Thr Gln Val Gly Ala Gly Ile
 850 855 860
 Gln Asp Gln Ser Ala Gly Ile Ser Glu Val Thr Ala Gly Tyr Gln Arg
 865 870 875 880
 Arg Gln Glu Glu Trp Ala Leu Gln Arg Asp Ile Ala Asp Asn Glu Ile
 885 890 895
 Thr Gln Leu Asp Ala Gln Ile Gln Ser Leu Gln Glu Gln Ile Thr Met
 900 905 910
 Ala Gln Lys Gln Ile Thr Leu Ser Glu Thr Glu Gln Ala Asn Ala Gln
 915 920 925
 Ala Ile Tyr Asp Leu Gln Thr Thr Arg Phe Thr Gly Gln Ala Leu Tyr
 930 935 940
 Asn Trp Met Ala Gly Arg Leu Ser Ala Leu Tyr Tyr Gln Met Tyr Asp
 945 950 955 960
 Ser Thr Leu Pro Ile Cys Leu Gln Ala Lys Ala Ala Leu Val Gln Glu
 965 970 975
 Leu Gly Glu Lys Glu Ser Asp Ser Leu Phe Gln Val Pro Val Trp Asn
 980 985 990
 Asp Leu Trp Gln Gly Leu Leu Ala Gly Glu Gly Leu Ser Ser Glu Leu
 995 1000 1005
 Gln Lys Leu Asp Ala Ile Trp Leu Ala Arg Gly Gly Ile Gly Leu Glu
 1010 1015 1020
 Ala Ile Arg Thr Val Ser Leu Asp Thr Leu Phe Gly Thr Gly Thr Leu
 1025 1030 1035 1040
 Ser Glu Asn Ile Asn Lys Val Leu Asn Gly Glu Thr Val Ser Pro Ser
 1045 1050 1055
 Gly Gly Val Thr Leu Ala Leu Thr Gly Asp Ile Phe Gln Ala Thr Leu
 1060 1065 1070
 Asp Leu Ser Gln Leu Gly Leu Asp Asn Ser Tyr Asn Leu Gly Asn Glu
 1075 1080 1085
 Lys Lys Arg Arg Ile Lys Arg Ile Ala Val Thr Leu Pro Thr Leu Leu
 1090 1095 1100
 Gly Pro Tyr Gln Asp Leu Glu Ala Thr Leu Val Met Gly Ala Glu Ile
 1105 1110 1115 1120
 Ala Ala Leu Ser His Gly Val Asn Asp Gly Gly Arg Phe Val Thr Asp
 1125 1130 1135
 Phe Asn Asp Ser Arg Phe Leu Pro Phe Glu Gly Arg Asp Ala Thr Thr
 1140 1145 1150
 Gly Thr Leu Glu Leu Asn Ile Phe His Ala Gly Lys Glu Gly Thr Gln
 1155 1160 1165
 His Glu Leu Val Ala Asn Leu Ser Asp Ile Ile Val His Leu Asn Tyr
 1170 1175 1180
 Ile Ile Arg Asp Ala
 1185

<210> 9

<211> 1043

<212> PRT

<213> Photorhabdus luminescens

<400> 9

Met Ser Pro Ser Glu Thr Thr Leu Tyr Thr Gln Thr Pro Thr Val Ser

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Ile	Val	Ile	Gly	Gly	Asp	Thr	Asp	Thr	Arg	Val	Thr	Arg	His	Gln	Tyr	
Asp	Ala	Arg	Gly	His	Leu	Asn	Tyr	Ser	Ile	Asp	Pro	Arg	Leu	Tyr	Asp	
Ala	Lys	Gln	Ala	Asp	Asn	Ser	Val	Lys	Pro	Asn	Phe	Val	Trp	Gln	His	
Asp	Leu	Ala	Gly	His	Ala	Leu	Arg	Thr	Glu	Ser	Val	Asp	Ala	Gly	Arg	
Thr	Val	Ala	Leu	Asn	Asp	Ile	Glu	Gly	Arg	Ser	Val	Met	Thr	Met	Asn	
Ala	Thr	Gly	Val	Arg	Gln	Thr	Arg	Arg	Tyr	Glu	Gly	Asn	Thr	Leu	Pro	
Gly	Arg	Leu	Leu	Ser	Val	Ser	Glu	Gln	Val	Phe	Asn	Gln	Glu	Ser	Ala	
Lys	Val	Thr	Glu	Arg	Phe	Ile	Trp	Ala	Gly	Asn	Thr	Thr	Ser	Glu	Lys	
Glu	Tyr	Asn	Leu	Ser	Gly	Leu	Cys	Ile	Arg	His	Tyr	Asp	Thr	Ala	Gly	
Val	Thr	Arg	Leu	Met	Ser	Gln	Ser	Leu	Ala	Gly	Ala	Met	Leu	Ser	Gln	
Ser	His	Gln	Leu	Leu	Ala	Glu	Gly	Gln	Glu	Ala	Asn	Trp	Ser	Gly	Asp	
Asp	Glu	Thr	Val	Trp	Gln	Gly	Met	Leu	Ala	Ser	Glu	Val	Tyr	Thr	Thr	
Gln	Ser	Thr	Thr	Asn	Ala	Ile	Gly	Ala	Leu	Leu	Thr	Gln	Thr	Asp	Ala	
Lys	Gly	Asn	Ile	Gln	Arg	Leu	Ala	Tyr	Asp	Ile	Ala	Gly	Gln	Leu	Lys	
Gly	Ser	Trp	Leu	Thr	Val	Lys	Gly	Gln	Ser	Glu	Gln	Val	Ile	Val	Lys	
Ser	Leu	Ser	Trp	Ser	Ala	Ala	Gly	His	Lys	Leu	Arg	Glu	Glu	His	Gly	
Asn	Gly	Val	Val	Thr	Glu	Tyr	Ser	Tyr	Glu	Pro	Glu	Thr	Gln	Arg	Leu	
Ile	Gly	Ile	Thr	Thr	Arg	Arg	Ala	Glu	Gly	Ser	Gln	Ser	Gly	Ala	Arg	
Val	Leu	Gln	Asp	Leu	Arg	Tyr	Lys	Tyr	Asp	Pro	Val	Gly	Asn	Val	Ile	
Ser	Ile	His	Asn	Asp	Ala	Glu	Ala	Thr	Arg	Phe	Trp	Arg	Asn	Gln	Lys	
Val	Glu	Pro	Glu	Asn	Arg	Tyr	Val	Tyr	Asp	Ser	Leu	Tyr	Gln	Leu	Met	
Ser	Ala	Thr	Gly	Arg	Glu	Met	Ala	Asn	Ile	Gly	Gln	Gln	Ser	Asn	Gln	
Leu	Pro	Ser	Pro	Val	Ile	Pro	Val	Pro	Thr	Asp	Asp	Ser	Thr	Tyr	Thr	
Asn	Tyr	Leu	Arg	Thr	Tyr	Thr	Tyr	Asp	Arg	Gly	Gly	Asn	Leu	Val	Gln	
Ile	Arg	His	Ser	Ser	Pro	Ala	Thr	Gln	Asn	Ser	Tyr	Thr	Thr	Asp	Ile	
Thr	Val	Ser	Ser	Arg	Ser	Asn	Arg	Ala	Val	Leu	Ser	Thr	Leu	Thr	Thr	
Asp	Pro	Thr	Arg	Val	Asp	Ala	Leu	Phe	Asp	Ser	Gly	Gly	His	Gln	Lys	
Met	Leu	Ile	Pro	Gly	Gln	Asn	Leu	Asp	Trp	Asn	Ile	Arg	Gly	Glu	Leu	
Gln	Arg	Val	Thr	Pro	Val	Ser	Arg	Glu	Asn	Ser	Ser	Asp	Ser	Glu	Trp	
Tyr	Arg	Tyr	Ser	Ser	Asp	Gly	Met	Arg	Leu	Leu	Lys	Val	Ser	Glu	Gln	

Gln Thr Gly Asn Ser Thr Gln Val Gln Arg Val Thr Tyr Leu Pro Gly
 515 520 525
 Leu Glu Leu Arg Thr Thr Gly Val Ala Asp Lys Thr Thr Glu Asp Leu
 530 535 540
 Gln Val Ile Thr Val Gly Glu Ala Gly Arg Ala Gln Val Arg Val Leu
 545 550 555
 His Trp Glu Ser Gly Lys Pro Thr Asp Ile Asp Asn Asn Gln Val Arg
 565 570 575
 Tyr Ser Tyr Asp Asn Leu Leu Gly Ser Ser Gln Leu Glu Leu Asp Ser
 580 585 590
 Glu Gly Gln Ile Leu Ser Gln Glu Glu Tyr Tyr Pro Tyr Gly Gly Thr
 595 600 605
 Ala Ile Trp Ala Ala Arg Asn Gln Thr Glu Ala Ser Tyr Lys Phe Ile
 610 615 620
 Arg Tyr Ser Gly Lys Glu Arg Asp Ala Thr Gly Leu Tyr Tyr Tyr Gly
 625 630 635 640
 Tyr Arg Tyr Tyr Gln Pro Trp Val Gly Arg Trp Leu Ser Ala Asp Pro
 645 650 655
 Ala Gly Thr Val Asp Gly Leu Asn Leu Tyr Arg Met Val Arg Asn Asn
 660 665 670
 Pro Ile Thr Leu Thr Asp His Asp Gly Leu Ala Pro Ser Pro Asn Arg
 675 680 685
 Asn Arg Asn Thr Phe Trp Phe Ala Ser Phe Leu Phe Arg Lys Pro Asp
 690 695 700
 Glu Gly Met Ser Ala Ser Met Arg Arg Gly Gln Lys Ile Gly Arg Ala
 705 710 715 720
 Ile Ala Gly Gly Ile Ala Ile Gly Gly Leu Ala Ala Thr Ile Ala Ala
 725 730 735
 Thr Ala Gly Ala Ala Ile Pro Val Ile Leu Gly Val Ala Ala Val Gly
 740 745 750
 Ala Gly Ile Gly Ala Leu Met Gly Tyr Asn Val Gly Ser Leu Leu Glu
 755 760 765
 Lys Gly Gly Ala Leu Leu Ala Arg Leu Val Gln Gly Lys Ser Thr Leu
 770 775 780
 Val Gln Ser Ala Ala Gly Ala Ala Ala Gly Ala Ser Ser Ala Ala Ala
 785 790 795 800
 Tyr Gly Ala Arg Ala Gln Gly Val Gly Val Ala Ser Ala Ala Gly Ala
 805 810 815
 Val Thr Gly Ala Val Gly Ser Trp Ile Asn Asn Ala Asp Arg Gly Ile
 820 825 830
 Gly Gly Ala Ile Gly Ala Gly Ser Ala Val Gly Thr Ile Asp Thr Met
 835 840 845
 Leu Gly Thr Ala Ser Thr Leu Thr His Glu Val Gly Ala Ala Ala Gly
 850 855 860
 Gly Ala Ala Gly Gly Met Ile Thr Gly Thr Gln Gly Ser Thr Arg Ala
 865 870 875 880
 Gly Ile His Ala Gly Ile Gly Thr Tyr Tyr Gly Ser Trp Ile Gly Phe
 885 890 895
 Gly Leu Asp Val Ala Ser Asn Pro Ala Gly His Leu Ala Asn Tyr Ala
 900 905 910
 Val Gly Tyr Ala Ala Gly Leu Gly Ala Glu Met Ala Val Asn Arg Ile
 915 920 925
 Met Gly Gly Gly Phe Leu Ser Arg Leu Leu Gly Arg Val Val Ser Pro
 930 935 940
 Tyr Ala Ala Gly Leu Ala Arg Gln Leu Val His Phe Ser Val Ala Arg
 945 950 955 960
 Pro Val Phe Glu Pro Ile Phe Ser Val Leu Gly Gly Leu Val Gly Gly
 965 970 975
 Ile Gly Thr Gly Leu His Arg Val Met Gly Arg Glu Ser Trp Ile Ser
 980 985 990
 Arg Ala Leu Ser Ala Ala Gly Ser Gly Ile Asp His Val Ala Gly Met
 995 1000 1005
 Ile Gly Asn Gln Ile Arg Gly Arg Val Leu Thr Thr Thr Gly Ile Ala

1010 1015 1020
 Asn Ala Ile Asp Tyr Gly Thr Ser Ala Val Gly Ala Ala Arg Arg Val
 1025 1030 1035 1040
 Phe Ser Leu

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 <212> PRT
 <213> Photorhabdus luminescens, Serratia entomophila

<400> 10

Arg Arg Arg Arg Glu
 1 5

<210> 11
 <211> 21
 <212> DNA
 <213> plasmid-Tn10

<400> 11
 atgacaagat gtgtatccac c

21

<210> 12
 <211> 1565
 <212> PRT
 <213> Photorhabdus luminescens

<400> 12

Met Leu Ser Thr Met Glu Lys Gln Leu Asn Glu Ser Gln Arg Asp Ala
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 Leu Val Thr Gly Tyr Met Asn Phe Val Ala Pro Thr Leu Lys Gly Val
 20 25 30
 Ser Gly Gln Pro Val Thr Val Glu Asp Leu Tyr Glu Tyr Leu Leu Ile
 35 40 45
 Asp Pro Glu Val Ala Asp Glu Val Glu Thr Ser Arg Val Ala Gln Ala
 50 55 60
 Ile Ala Ser Ile Gln Gln Tyr Met Thr Arg Leu Val Asn Gly Ser Glu
 65 70 75 80
 Pro Gly Arg Gln Ala Met Glu Pro Ser Thr Ala Asn Glu Trp Arg Asp
 85 90 95
 Asn Asp Asn Gln Tyr Ala Ile Trp Ala Ala Gly Ala Glu Val Arg Asn
 100 105 110
 Tyr Ala Glu Asn Tyr Ile Ser Pro Ile Thr Arg Gln Glu Lys Ser His
 115 120 125
 Tyr Phe Ser Glu Leu Glu Thr Thr Leu Asn Gln Asn Arg Leu Asp Pro
 130 135 140
 Asp Arg Val Gln Asp Ala Val Leu Ala Tyr Leu Asn Glu Phe Glu Ala
 145 150 155 160
 Val Ser Asn Leu Tyr Val Leu Ser Gly Tyr Ile Asn Gln Asp Lys Phe
 165 170 175
 Asp Gln Ala Ile Tyr Tyr Phe Ile Gly Arg Thr Thr Thr Lys Pro Tyr
 180 185 190
 Arg Tyr Tyr Trp Arg Gln Met Asp Leu Ser Lys Asn Arg Gln Asp Pro
 195 200 205
 Ala Gly Asn Pro Val Thr Pro Asn Cys Trp Asn Asp Trp Gln Glu Ile
 210 215 220
 Thr Leu Pro Leu Ser Gly Asp Thr Val Leu Glu His Thr Val Arg Pro
 225 230 235 240
 Val Phe Tyr Asn Asp Arg Leu Tyr Val Ala Trp Val Glu Arg Asp Pro

Ala	Val	Gln	Lys	245	Asp	Ala	Asp	Gly	Lys	250	Asn	Ile	Gly	Lys	255	Thr	His	Ala
Tyr	Asn	Ile	Lys	260	Phe	Gly	Tyr	Lys	265	Arg	Tyr	Asp	Asp	Thr	270	Trp	Thr	Ala
Pro	Asn	Thr	Thr	275	Thr	Leu	Met	Thr	280	Gln	Gln	Ala	Gly	285	Glu	Ser	Ser	Glu
Thr	305	Gln	Arg	Ser	Ser	Leu	Leu	Ile	310	Asp	Glu	Ser	Ser	315	Thr	Thr	Leu	Arg
Gln	Val	Asn	Leu	Leu	325	Ala	Thr	Thr	330	Asp	Phe	Ser	Ile	335	Asp	Pro	Thr	Glu
Glu	Thr	Asp	Ser	340	Asn	Pro	Tyr	Gly	345	Arg	Leu	Met	Leu	350	Gly	Val	Phe	Val
Arg	Gln	Phe	Glu	355	Gly	Asp	Gly	Ala	360	Asn	Arg	Lys	Asn	365	Lys	Pro	Val	Val
Tyr	Gly	Tyr	Leu	Tyr	Cys	Asp	Ser	Ala	375	Phe	Asn	Arg	His	380	Arg	Val	Leu	Arg
Pro	385	Leu	Ser	Lys	Asn	Phe	Leu	Phe	390	Ser	Thr	Tyr	Arg	395	Asp	Glu	Thr	Asp
Gly	Gln	Asn	Ser	Leu	405	Gln	Phe	Ala	410	Val	Tyr	Asp	Lys	415	Lys	Tyr	Val	Ile
Thr	Lys	Val	Val	Thr	420	Gly	Ala	Thr	425	Glu	Asp	Pro	Glu	430	Asn	Thr	Gly	Trp
Val	Ser	Lys	Val	Asp	435	Asp	Leu	Lys	440	Gln	Gly	Thr	Thr	445	Gly	Ala	Tyr	Val
Tyr	Ile	Asp	Gln	Asp	450	Gly	Leu	Thr	455	Leu	His	Ile	Gln	460	Thr	Thr	Thr	Asn
Gly	465	Asp	Phe	Ile	Asn	Arg	His	Thr	470	Phe	Gly	Tyr	Asn	475	Asp	Leu	Val	Tyr
Asp	Ser	Lys	Ser	Gly	485	Tyr	Gly	Phe	490	Thr	Trp	Ser	Gly	495	Asn	Glu	Gly	Phe
Tyr	Leu	Asp	Tyr	His	500	Asp	Gly	Asn	505	Tyr	Thr	Phe	His	510	Asn	Ala	Ile	
Ile	Asn	Tyr	Tyr	Pro	515	Ser	Gly	Tyr	520	Gly	Gly	Gly	Ser	525	Val	Pro	Asn	Gly
Thr	Trp	Ala	Leu	Glu	530	Gln	Arg	Ile	535	Asn	Glu	Gly	Trp	540	Ala	Ile	Ala	Pro
Leu	545	Leu	Asp	Thr	Leu	His	Thr	Val	550	Thr	Val	Lys	Gly	555	Ser	Tyr	Ile	Ala
Trp	Glu	Gly	Glu	Thr	565	Pro	Thr	Gly	570	Tyr	Asn	Leu	Tyr	575	Ile	Pro	Asp	Gly
Thr	Val	Leu	Leu	Asp	580	Trp	Phe	Asp	585	Ile	Asn	Phe	Ala	590	Ile	Gly	Leu	
Asn	Lys	Leu	Glu	Ser	595	Val	Phe	Thr	600	Ser	Pro	Asp	Trp	605	Pro	Thr	Leu	Thr
Thr	Ile	Lys	Asn	Phe	610	Ser	Lys	Ile	615	Ala	Asp	Asn	Arg	620	Lys	Phe	Tyr	Gln
Glu	Ile	Asn	Ala	Glu	625	Thr	Ala	Asp	630	Gly	Arg	Asn	Leu	635	Phe	Lys	Arg	Tyr
Ser	Thr	Gln	Thr	Phe	645	Gly	Leu	Thr	650	Ser	Gly	Ala	Thr	655	Tyr	Ser	Thr	Thr
Tyr	Thr	Leu	Ser	Glu	660	Ala	Asp	Phe	665	Ser	Thr	Asp	Pro	670	Asp	Lys	Asn	Tyr
Leu	Gln	Val	Cys	Leu	675	Asn	Val	Val	680	Trp	Asp	His	Tyr	685	Asp	Arg	Pro	Ser
Gly	Lys	Lys	Gly	Ala	690	Tyr	Ser	Trp	695	Val	Ser	Lys	Trp	700	Phe	Asn	Val	Tyr
Val	Ala	Leu	Gln	Asp	705	Ser	Lys	Ala	710	Pro	Asp	Ala	Ile	715	Pro	Arg	Leu	Val
Ser	Arg	Tyr	Asp	Ser	725	Lys	Arg	Gly	730	Val	Gln	Tyr	Leu	735	Asp	Phe	Thr	Trp
Thr	Ser	Ser	Leu	Pro	740	Ala	Lys	Thr	745	Arg	Leu	Asn	Thr	750	Phe	Val	Arg	

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Thr Leu Ile Glu Lys Ala Asn Leu Gly Leu Asp Ser Leu Leu Asp Tyr
755 760 765
Thr Leu Gln Ala Asp Pro Ser Leu Glu Ala Asp Leu Val Thr Asp Gly
770 775 780
Lys Ser Glu Pro Met Asp Phe Asn Gly Ser Asn Gly Leu Tyr Phe Trp
785 790 795 800
Glu Leu Phe Phe His Leu Pro Phe Leu Val Ala Thr Arg Phe Ala Asn
805 810 815
Glu Gln Gln Phe Ser Pro Ala Gln Lys Ser Leu His Tyr Ile Phe Asp
820 825 830
Pro Ala Met Lys Asn Lys Pro His Asn Ala Pro Ala Tyr Trp Asn Val
835 840 845
Arg Pro Leu Val Glu Gly Asn Ser Asp Leu Ser Arg His Leu Asp Asp
850 855 860
Ser Ile Asp Pro Asp Thr Gln Ala Tyr Ala His Pro Val Ile Tyr Gln
865 870 875 880
Lys Ala Val Phe Ile Ala Tyr Val Ser Asn Leu Ile Ala Gln Gly Asp
885 890 895
Met Trp Tyr Arg Gln Leu Thr Arg Asp Gly Leu Thr Gln Ala Arg Val
900 905
Tyr Tyr Asn Leu Ala Ala Glu Leu Leu Gly Pro Arg Pro Asp Val Ser
915 920 925
Leu Ser Ser Ile Trp Thr Pro Gln Thr Leu Asp Thr Leu Ala Ala Gly
930 935 940
Gln Lys Ala Val Leu Arg Asp Phe Glu His Gln Leu Ala Asn Ser Asp
945 950 955 960
Thr Ala Leu Pro Ala Leu Pro Gly Arg Asn Val Ser Tyr Leu Lys Leu
965 970 975
Ala Asp Asn Gly Tyr Phe Asn Glu Pro Leu Asn Val Leu Met Leu Ser
980 985 990
His Trp Asp Thr Leu Asp Ala Arg Leu Tyr Asn Leu Arg His Asn Leu
995 1000 1005
Thr Val Asp Gly Lys Pro Leu Ser Leu Pro Leu Tyr Ala Ala Pro Val
1010 1015 1020
Asp Pro Val Ala Leu Leu Ala Gln Arg Ala Gln Ser Gly Thr Leu Thr
1025 1030 1035 1040
Asn Gly Val Ser Gly Ala Met Leu Thr Val Pro Pro Tyr Arg Phe Ser
1045 1050 1055
Ala Met Leu Pro Arg Ala Tyr Ser Ala Val Gly Thr Leu Thr Ser Phe
1060 1065 1070
Gly Gln Asn Leu Leu Ser Leu Leu Glu Arg Ser Glu Arg Ala Cys Gln
1075 1080 1085
Glu Glu Leu Ala Gln Gln Gln Leu Leu Asp Met Ser Ser Tyr Ala Ile
1090 1095 1100
Thr Leu Gln Gln Gln Ala Leu Asp Gly Leu Ala Ala Asp Arg Leu Ala
1105 1110 1115 1120
Leu Leu Ala Ser Gln Ala Thr Ala Gln Gln Arg His Asp His Tyr Tyr
1125 1130 1135
Thr Leu Tyr Gln Asn Asn Ile Ser Ser Ala Glu Gln Leu Val Met Asp
1140 1145 1150
Thr Gln Thr Ser Ala Gln Ser Leu Ile Ser Ser Ser Thr Gly Val Gln
1155 1160 1165
Thr Ala Ser Gly Ala Leu Lys Val Ile Pro Asn Ile Phe Gly Leu Ala
1170 1175 1180
Asp Gly Gly Ser Arg Tyr Glu Gly Val Thr Glu Ala Ile Ala Ile Gly
1185 1190 1195 1200
Leu Met Ala Ala Gly Gln Ala Thr Ser Val Val Ala Glu Arg Leu Ala
1205 1210 1215
Thr Thr Glu Asn Tyr Arg Arg Arg Arg Glu Glu Trp Gln Ile Gln Tyr
1220 1225 1230
Gln Gln Ala Gln Ser Glu Val Asp Ala Leu Gln Lys Gln Leu Asp Ala
1235 1240 1245
Leu Ala Val Arg Glu Lys Ala Ala Gln Thr Ser Leu Gln Gln Ala Lys

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1250 1255 1260
Ala Gln Gln Val Gln Ile Arg Thr Met Leu Thr Tyr Leu Thr Thr Arg
1265 1270 1275 1280
Phe Thr Gln Ala Thr Leu Tyr Gln Trp Leu Ser Gly Gln Leu Ser Ala
1285 1290 1295
Leu Tyr Tyr Gln Ala Tyr Asp Ala Val Val Ala Leu Cys Leu Ser Ala
1300 1305 1310
Gln Ala Cys Trp Gln Tyr Glu Leu Gly Asp Tyr Ala Thr Thr Phe Ile
1315 1320 1325
Gln Thr Gly Thr Trp Asn Asp His Tyr Arg Gly Leu Gln Val Gly Glu
1330 1335 1340
Thr Leu Gln Leu Asn Leu His Gln Met Glu Ala Tyr Leu Val Arg
1345 1350 1355 1360
His Glu Arg Arg Leu Asn Val Ile Arg Thr Val Ser Leu Lys Ser Leu
1365 1370 1375
Leu Gly Asp Asp Gly Phe Gly Lys Leu Lys Thr Glu Gly Lys Val Asp
1380 1385 1390
Phe Pro Leu Ser Glu Lys Leu Phe Asp Asn Asp Tyr Pro Gly His Tyr
1395 1400 1405
Leu Arg Gln Ile Lys Thr Val Ser Val Thr Leu Pro Thr Leu Val Gly
1410 1415 1420
Pro Tyr Gln Asn Val Lys Ala Thr Leu Thr Gln Thr Ser Ser Ser Ile
1425 1430 1435 1440
Leu Leu Ala Ala Asp Ile Asn Gly Val Lys Arg Leu Asn Asp Pro Thr
1445 1450 1455
Gly Lys Glu Gly Asp Ala Thr His Ile Val Thr Asn Leu Arg Ala Ser
1460 1465 1470
Gln Gln Val Ala Leu Ser Ser Gly Ile Asn Asp Ala Gly Ser Phe Glu
1475 1480 1485
Leu Arg Leu Glu Asp Glu Arg Tyr Leu Ser Phe Glu Gly Thr Gly Ala
1490 1495 1500
Val Ser Lys Trp Thr Leu Asn Phe Pro Arg Ser Val Asp Glu His Ile
1505 1510 1515 1520
Asp Asp Lys Thr Leu Lys Ala Asp Glu Met Gln Ala Ala Leu Leu Ala
1525 1530 1535
Asn Met Asp Asp Val Leu Val Gln Val His Tyr Thr Ala Cys Asp Gly
1540 1545 1550
Gly Ala Ser Phe Ala Asn Gln Val Lys Lys Thr Leu Ser
1555 1560 1565

<210> 13
<211> 2504
<212> PRT
<213> Photorhabdus luminescens

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Gln Leu Thr Cys Pro Ala Glu Ile Ala Leu Tyr Pro Phe Asp Thr Phe
20 25 30
Arg Glu Lys Thr Arg Gly Met Val Asn Trp Gly Glu Ala Lys Arg Ile
35 40 45
Tyr Glu Ile Ala Gln Ala Glu Gln Asp Arg Asn Leu His Glu Lys
50 55 60
Arg Ile Phe Ala Tyr Ala Asn Pro Leu Leu Lys Asn Ala Val Arg Leu
65 70 75 80
Gly Thr Arg Gln Met Leu Gly Phe Ile Gln Gly Tyr Ser Asp Leu Phe
85 90 95
Gly Asn Arg Ala Asp Asn Tyr Ala Ala Pro Gly Ser Val Ala Ser Met
100 105 110
Phe Ser Pro Ala Ala Tyr Leu Thr Glu Leu Tyr Arg Glu Ala Lys Asn
115 120 125

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Leu	His	Asp	Ser	Ser	Ser	Ile	Tyr	Tyr	Leu	Asp	Lys	Arg	Arg	Pro	Asp
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Leu	Ala	Ser	Leu	Met	Leu	Ser	Gln	Lys	Asn	Met	Asp	Glu	Glu	Ile	Ser
145					150					155					160
Thr	Leu	Ala	Leu	Ser	Asn	Glu	Leu	Cys	Leu	Ala	Gly	Ile	Glu	Thr	Lys
				165					170					175	
Thr	Gly	Lys	Ser	Gln	Asp	Glu	Val	Met	Asp	Met	Leu	Ser	Thr	Tyr	Arg
			180					185					190		
Leu	Ser	Gly	Glu	Thr	Pro	Tyr	His	His	Ala	Tyr	Glu	Thr	Val	Arg	Glu
		195					200					205			
Ile	Val	His	Glu	Arg	Asp	Pro	Gly	Phe	Arg	His	Leu	Ser	Gln	Ala	Pro
210					215						220				
Ile	Val	Ala	Ala	Lys	Leu	Asp	Pro	Val	Thr	Leu	Leu	Gly	Ile	Ser	Ser
225					230					235					240
His	Ile	Ser	Pro	Glu	Leu	Tyr	Asn	Leu	Leu	Ile	Glu	Glu	Ile	Pro	Glu
				245					250					255	
Lys	Asp	Glu	Ala	Ala	Leu	Asp	Thr	Leu	Tyr	Lys	Thr	Asn	Phe	Gly	Asp
			260					265					270		
Ile	Thr	Thr	Ala	Gln	Leu	Met	Ser	Pro	Ser	Tyr	Leu	Ala	Arg	Tyr	Tyr
		275					280					285			
Gly	Val	Ser	Pro	Glu	Asp	Ile	Ala	Tyr	Val	Thr	Thr	Ser	Leu	Ser	His
	290				295						300				
Val	Gly	Tyr	Ser	Ser	Asp	Ile	Leu	Val	Ile	Pro	Leu	Val	Asp	Gly	Val
305					310					315					320
Gly	Lys	Met	Glu	Val	Val	Arg	Val	Thr	Arg	Thr	Pro	Ser	Asp	Asn	Tyr
				325					330					335	
Thr	Ser	Gln	Thr	Asn	Tyr	Ile	Glu	Leu	Tyr	Pro	Gln	Gly	Gly	Asp	Asn
			340					345					350		
Tyr	Leu	Ile	Lys	Tyr	Asn	Leu	Ser	Asn	Ser	Phe	Gly	Leu	Asp	Asp	Phe
		355					360					365			
Tyr	Leu	Gln	Tyr	Lys	Asp	Gly	Ser	Ala	Asp	Trp	Thr	Glu	Ile	Ala	His
		370				375					380				
Asn	Pro	Tyr	Pro	Asp	Met	Val	Ile	Asn	Gln	Lys	Tyr	Glu	Ser	Gln	Ala
385					390					395					400
Thr	Ile	Lys	Arg	Ser	Asp	Ser	Asp	Asn	Ile	Leu	Ser	Ile	Gly	Leu	Gln
				405					410					415	
Arg	Trp	His	Ser	Gly	Ser	Tyr	Asn	Phe	Ala	Ala	Ala	Asn	Phe	Lys	Ile
			420					425					430		
Asp	Gln	Tyr	Ser	Pro	Lys	Ala	Phe	Leu	Leu	Lys	Met	Asn	Lys	Ala	Ile
			435				440					445			
Arg	Leu	Leu	Lys	Ala	Thr	Gly	Leu	Ser	Phe	Ala	Thr	Leu	Glu	Arg	Ile
	450					455					460				
Val	Asp	Ser	Val	Asn	Ser	Thr	Lys	Ser	Ile	Thr	Val	Glu	Val	Leu	Asn
465					470					475					480
Lys	Val	Tyr	Arg	Val	Lys	Phe	Tyr	Ile	Asp	Arg	Tyr	Gly	Ile	Ser	Glu
				485					490					495	
Glu	Thr	Ala	Ala	Ile	Leu	Ala	Asn	Ile	Asn	Ile	Ser	Gln	Gln	Ala	Val
			500					505					510		
Gly	Asn	Gln	Leu	Ser	Gln	Phe	Glu	Gln	Leu	Phe	Asn	His	Pro	Pro	Leu
		515					520					525			
Asn	Gly	Ile	Arg	Tyr	Glu	Ile	Ser	Glu	Asp	Asn	Ser	Lys	His	Leu	Pro
	530					535					540				
Asn	Pro	Asp	Leu	Asn	Leu	Lys	Pro	Asp	Ser	Thr	Gly	Asp	Asp	Gln	Arg
545					550					555					560
Lys	Ala	Val	Leu	Lys	Arg	Ala	Phe	Gln	Val	Asn	Ala	Ser	Glu	Leu	Tyr
				565					570					575	
Gln	Met	Leu	Leu	Ile	Thr	Asp	Arg	Lys	Glu	Asp	Gly	Val	Ile	Lys	Asn
			580					585					590		
Asn	Leu	Glu	Asn	Leu	Ser	Asp	Leu	Tyr	Leu	Val	Ser	Leu	Leu	Ala	Gln
		595					600					605			
Ile	His	Asn	Leu	Thr	Ile	Ala	Glu	Leu	Asn	Ile	Leu	Leu	Val	Ile	Cys
	610					615					620				
Gly	Tyr	Gly	Asp	Thr	Asn	Ile	Tyr	Gln	Ile	Thr	Asp	Asp	Asn	Leu	Ala

625 630 635 640
 Lys Ile Val Glu Thr Leu Leu Trp Ile Thr Gln Trp Leu Lys Thr Gln
 Lys Trp Thr Val Thr Asp Leu Phe Leu Met Thr Thr Ala Thr Tyr Ser
 Thr Thr Leu Thr Pro Glu Ile Ser Asn Leu Thr Ala Thr Leu Ser Ser
 Thr Leu His Gly Lys Glu Ser Leu Ile Gly Glu Asp Leu Lys Arg Ala
 Met Ala Pro Cys Phe Thr Ser Ala Leu His Leu Thr Ser Gln Glu Val
 Ala Tyr Asp Leu Leu Trp Ile Asp Gln Ile Gln Pro Ala Gln Ile
 Thr Val Asp Gly Phe Trp Glu Glu Val Gln Thr Thr Pro Thr Ser Leu
 Lys Val Ile Thr Phe Ala Gln Val Leu Ala Gln Leu Ser Leu Ile Tyr
 Arg Arg Ile Gly Leu Ser Glu Thr Glu Leu Ser Leu Ile Val Thr Gln
 Ser Ser Leu Leu Val Ala Gly Lys Ser Ile Leu Asp His Gly Leu Leu
 Thr Leu Met Ala Leu Glu Gly Phe His Thr Trp Val Asn Gly Leu Gly
 Gln His Ala Ser Leu Ile Leu Ala Ala Leu Lys Asp Gly Ala Leu Thr
 Val Thr Asp Val Ala Gln Ala Met Asn Lys Glu Glu Ser Leu Leu Gln
 Met Ala Ala Asn Gln Val Glu Lys Asp Leu Thr Lys Leu Thr Ser Trp
 Thr Gln Ile Asp Ala Ile Leu Gln Trp Leu Gln Met Ser Ser Ala Leu
 Ala Val Ser Pro Leu Asp Leu Ala Gly Met Met Ala Leu Lys Tyr Gly
 Ile Asp His Asn Tyr Ala Ala Trp Gln Ala Ala Ala Ala Ala Leu Met
 Ala Asp His Ala Asn Gln Ala Gln Lys Lys Leu Asp Glu Thr Phe Ser
 Lys Ala Leu Cys Asn Tyr Tyr Ile Asn Ala Val Val Asp Ser Ala Ala
 Gly Val Arg Asp Arg Asn Gly Leu Tyr Thr Tyr Leu Leu Ile Asp Asn
 Gln Val Ser Ala Asp Val Ile Thr Ser Arg Ile Ala Glu Ala Ile Ala
 Gly Ile Gln Leu Tyr Val Asn Arg Ala Leu Asn Arg Asp Glu Gly Gln
 Leu Ala Ser Asp Val Ser Thr Arg Gln Phe Phe Thr Asp Trp Glu Arg
 Tyr Asn Lys Arg Tyr Ser Thr Trp Ala Gly Val Ser Glu Leu Val Tyr
 Tyr Pro Glu Asn Tyr Val Asp Pro Thr Gln Arg Ile Gly Gln Thr Lys
 Met Met Asp Ala Leu Leu Gln Ser Ile Asn Gln Ser Gln Leu Asn Ala
 Asp Thr Val Glu Asp Ala Phe Lys Thr Tyr Leu Thr Ser Phe Glu Gln
 Val Ala Asn Leu Lys Val Ile Ser Ala Tyr His Asp Asn Val Asn Val
 Asp Gln Gly Leu Thr Tyr Phe Ile Gly Ile Asp Gln Ala Ala Pro Gly
 Thr Tyr Tyr Trp Arg Ser Val Asp His Ser Lys Cys Glu Asn Gly Lys
 Phe Ala Ala Asn Ala Trp Gly Glu Trp Asn Lys Ile Thr Cys Ala Val

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Asn Pro Trp Lys Asn Ile Ile Arg Pro Val Val Tyr Met Ser Arg Leu
1140 1145 1150
Tyr Leu Leu Trp Leu Glu Gln Gln Ser Lys Lys Ser Asp Asp Gly Lys
1155 1160 1165
Thr Thr Ile Tyr Gln Tyr Asn Leu Lys Leu Ala His Ile Arg Tyr Asp
1170 1175 1180
Gly Ser Trp Asn Thr Pro Phe Thr Phe Asp Val Thr Glu Lys Val Lys
1185 1190 1195 1200
Asn Tyr Thr Ser Ser Thr Asp Ala Ala Glu Ser Leu Gly Leu Tyr Cys
1205 1210 1215
Thr Gly Tyr Gln Gly Glu Asp Thr Leu Leu Val Met Phe Tyr Ser Met
1220 1225 1230
Gln Ser Ser Tyr Ser Ser Tyr Thr Asp Asn Asn Ala Pro Val Thr Gly
1235 1240 1245
Leu Tyr Ile Phe Ala Asp Met Ser Ser Asp Asn Met Thr Asn Ala Gln
1250 1255 1260
Ala Thr Asn Tyr Trp Asn Asn Ser Tyr Pro Gln Phe Asp Thr Val Met
1265 1270 1275 1280
Ala Asp Pro Asp Ser Asp Asn Lys Lys Val Ile Thr Arg Arg Val Asn
1285 1290 1295
Asn Arg Tyr Ala Glu Asp Tyr Glu Ile Pro Ser Ser Val Thr Ser Asn
1300 1305 1310
Ser Asn Tyr Ser Trp Gly Asp His Ser Leu Thr Met Leu Tyr Gly Gly
1315 1320 1325
Ser Val Pro Asn Ile Thr Phe Glu Ser Ala Ala Glu Asp Leu Arg Leu
1330 1335 1340
Ser Thr Asn Met Ala Leu Ser Ile Ile His Asn Gly Tyr Ala Gly Thr
1345 1350 1355 1360
Arg Arg Ile Gln Cys Asn Leu Met Lys Gln Tyr Ala Ser Leu Gly Asp
1365 1370 1375
Lys Phe Ile Ile Tyr Asp Ser Ser Phe Asp Asp Ala Asn Arg Phe Asn
1380 1385 1390
Leu Val Pro Leu Phe Lys Phe Gly Lys Asp Glu Asn Ser Asp Asp Ser
1395 1400 1405
Ile Cys Ile Tyr Asn Glu Asn Pro Ser Ser Glu Asp Lys Lys Trp Tyr
1410 1415 1420
Phe Ser Ser Lys Asp Asp Asn Lys Thr Ala Asp Tyr Asn Gly Gly Thr
1425 1430 1435 1440
Gln Cys Ile Asp Ala Gly Thr Ser Asn Lys Asp Phe Tyr Tyr Asn Leu
1445 1450 1455
Gln Glu Ile Glu Val Ile Ser Val Thr Gly Gly Tyr Trp Ser Ser Tyr
1460 1465 1470
Lys Ile Ser Asn Pro Ile Asn Ile Asn Thr Gly Ile Asp Ser Ala Lys
1475 1480 1485
Val Lys Val Thr Val Lys Ala Gly Gly Asp Asp Gln Ile Phe Thr Ala
1490 1495 1500
Asp Asn Ser Thr Tyr Val Pro Gln Gln Pro Ala Pro Ser Phe Glu Glu
1505 1510 1515 1520
Met Ile Tyr Gln Phe Asn Asn Leu Thr Ile Asp Cys Lys Asn Leu Asn
1525 1530 1535
Phe Ile Asp Asn Gln Ala His Ile Glu Ile Asp Phe Thr Ala Thr Ala
1540 1545 1550
Gln Asp Gly Arg Phe Leu Gly Ala Glu Thr Phe Ile Ile Pro Val Thr
1555 1560 1565
Lys Lys Val Leu Gly Thr Glu Asn Val Ile Ala Leu Tyr Ser Glu Asn
1570 1575 1580
Asn Gly Val Gln Tyr Met Gln Ile Gly Ala Tyr Arg Thr Arg Leu Asn
1585 1590 1595 1600
Thr Leu Phe Ala Gln Gln Leu Val Ser Arg Ala Asn Arg Gly Ile Asp
1605 1610 1615
Ala Val Leu Ser Met Glu Thr Gln Asn Ile Gln Glu Pro Gln Leu Gly
1620 1625 1630
Ala Gly Thr Tyr Val Gln Leu Val Leu Asp Lys Tyr Asp Glu Ser Ile

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1635      1640      1645
His Gly Thr Asn Lys Ser Phe Ala Ile Glu Tyr Val Asp Ile Phe Lys
1650      1655      1660
Glu Asn Asp Ser Phe Val Ile Tyr Gln Gly Glu Leu Ser Glu Thr Ser
1665      1670      1675      1680
Gln Thr Val Val Lys Val Phe Leu Ser Tyr Phe Ile Glu Ala Thr Gly
1685      1690      1695
Asn Lys Asn His Leu Trp Val Arg Ala Lys Tyr Gln Lys Glu Thr Thr
1700      1705      1710
Asp Lys Ile Leu Phe Asp Arg Thr Asp Glu Lys Asp Pro His Gly Trp
1715      1720      1725
Phe Leu Ser Asp Asp His Lys Thr Phe Ser Gly Leu Ser Ser Ala Gln
1730      1735      1740
Ala Leu Lys Asn Asp Ser Glu Pro Met Asp Phe Ser Gly Ala Asn Ala
1745      1750      1755      1760
Leu Tyr Phe Trp Glu Leu Phe Tyr Tyr Thr Pro Met Met Met Ala His
1765      1770      1775
Arg Leu Leu Gln Glu Gln Asn Phe Asp Ala Ala Asn His Trp Phe Arg
1780      1785      1790
Tyr Val Trp Ser Pro Ser Gly Tyr Ile Val Asp Gly Lys Ile Ala Ile
1795      1800      1805
Tyr His Trp Asn Val Arg Pro Leu Glu Glu Asp Thr Ser Trp Asn Ala
1810      1815      1820
Gln Gln Leu Asp Ser Thr Asp Pro Asp Ala Val Ala Gln Asp Asp Pro
1825      1830      1835      1840
Met His Tyr Lys Val Ala Thr Phe Met Ala Thr Leu Asp Leu Leu Met
1845      1850      1855
Ala Arg Gly Asp Ala Ala Tyr Arg Gln Leu Glu Arg Asp Thr Leu Ala
1860      1865      1870
Glu Ala Lys Met Trp Tyr Thr Gln Ala Leu Asn Leu Leu Gly Asp Glu
1875      1880      1885
Pro Gln Val Met Leu Ser Thr Thr Trp Ala Asn Pro Thr Leu Gly Asn
1890      1895      1900
Ala Ala Ser Lys Thr Thr Gln Gln Val Arg Gln Gln Val Leu Thr Gln
1905      1910      1915      1920
Leu Arg Leu Asn Ser Arg Val Lys Thr Pro Leu Leu Gly Thr Ala Asn
1925      1930      1935
Ser Leu Thr Ala Leu Phe Leu Pro Gln Glu Asn Ser Lys Leu Lys Gly
1940      1945      1950
Tyr Trp Arg Thr Leu Ala Gln Arg Met Phe Asn Leu Arg His Asn Leu
1955      1960      1965
Ser Ile Asp Gly Gln Pro Leu Ser Leu Pro Leu Tyr Ala Lys Pro Ala
1970      1975      1980
Asp Pro Lys Ala Leu Leu Ser Ala Ala Val Ser Ala Ser Gln Gly Gly
1985      1990      1995      2000
Ala Asp Leu Pro Lys Ala Pro Leu Thr Ile His Arg Phe Pro Gln Met
2005      2010      2015
Leu Glu Gly Ala Arg Gly Leu Val Asn Gln Leu Ile Gln Phe Gly Ser
2020      2025      2030
Ser Leu Leu Gly Tyr Ser Glu Arg Gln Asp Ala Glu Ala Met Ser Gln
2035      2040      2045
Leu Leu Gln Thr Gln Ala Ser Glu Leu Ile Leu Thr Ser Ile Arg Met
2050      2055      2060
Gln Asp Asn Gln Leu Ala Glu Leu Asp Ser Glu Lys Thr Ala Leu Gln
2065      2070      2075      2080
Val Ser Leu Ala Gly Val Gln Gln Arg Phe Asp Ser Tyr Ser Gln Leu
2085      2090      2095
Tyr Glu Glu Asn Ile Asn Ala Gly Glu Gln Arg Ala Leu Ala Leu Arg
2100      2105      2110
ser Glu ser Ala Ile Glu Ser Gln Gly Ala Gln Ile Ser Arg Met Ala
2115      2120      2125
Gly Ala Gly Val Asp Met Ala Pro Asn Ile Phe Gly Leu Ala Asp Gly
2130      2135      2140

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Gly Met His Tyr Gly Ala Ile Ala Tyr Ala Ile Ala Asp Gly Ile Glu
 2145 2150 2155 2160
 Leu Ser Ala Ser Ala Lys Met Val Asp Ala Glu Lys Val Ala Gln Ser
 2165 2170 2175
 Glu Ile Tyr Arg Arg Arg Arg Gln Glu Trp Lys Ile Gln Arg Asp Asn
 2180 2185 2190
 Ala Gln Ala Glu Ile Asn Gln Leu Asn Ala Gln Leu Glu Ser Leu Ser
 2195 2200 2205
 Ile Arg Arg Glu Ala Ala Glu Met Gln Lys Glu Tyr Leu Lys Thr Gln
 2210 2215 2220
 Gln Ala Gln Ala Gln Ala Gln Leu Thr Phe Leu Arg Ser Lys Phe Ser
 2225 2230 2235 2240
 Asn Gln Ala Leu Tyr Ser Trp Leu Arg Gly Arg Leu Ser Gly Ile Tyr
 2245 2250 2255
 Phe Gln Phe Tyr Asp Leu Ala Val Ser Arg Cys Leu Met Ala Glu Gln
 2260 2265 2270
 Ser Tyr Gln Trp Glu Ala Asn Asp Asn Ser Ile Ser Phe Val Lys Pro
 2275 2280 2285
 Gly Ala Trp Gln Gly Thr Tyr Ala Gly Leu Leu Cys Gly Glu Ala Leu
 2290 2295 2300
 Ile Gln Asn Leu Ala Gln Met Glu Glu Ala Tyr Leu Lys Trp Glu Ser
 2305 2310 2315 2320
 Arg Ala Leu Glu Val Glu Arg Thr Val Ser Leu Ala Val Val Tyr Asp
 2325 2330 2335
 Ser Leu Glu Gly Asn Asp Arg Phe Asn Leu Ala Glu Gln Ile Pro Ala
 2340 2345 2350
 Leu Leu Asp Lys Gly Glu Gly Thr Ala Gly Thr Lys Glu Asn Gly Leu
 2355 2360 2365
 Ser Leu Ala Asn Ala Ile Leu Ser Ala Ser Val Lys Leu Ser Asp Leu
 2370 2375 2380
 Lys Leu Gly Thr Asp Tyr Pro Asp Ser Ile Val Gly Ser Asn Lys Val
 2385 2390 2395 2400
 Arg Arg Ile Lys Gln Ile Ser Val Ser Leu Pro Ala Leu Val Gly Pro
 2405 2410 2415
 Tyr Gln Asp Val Gln Ala Met Leu Ser Tyr Gly Gly Ser Thr Gln Leu
 2420 2425 2430
 Pro Lys Gly Cys Ser Ala Leu Ala Val Ser His Gly Thr Asn Asp Ser
 2435 2440 2445
 Gly Gln Phe Gln Leu Asp Phe Asn Asp Gly Lys Tyr Leu Pro Phe Glu
 2450 2455 2460
 Gly Ile Ala Leu Asp Asp Gln Gly Thr Leu Asn Leu Gln Phe Pro Asn
 2465 2470 2475 2480
 Ala Thr Asp Lys Gln Lys Ala Ile Leu Gln Thr Met Ser Asp Ile Ile
 2485 2490 2495
 Leu His Ile Arg Tyr Thr Ile Arg
 2500